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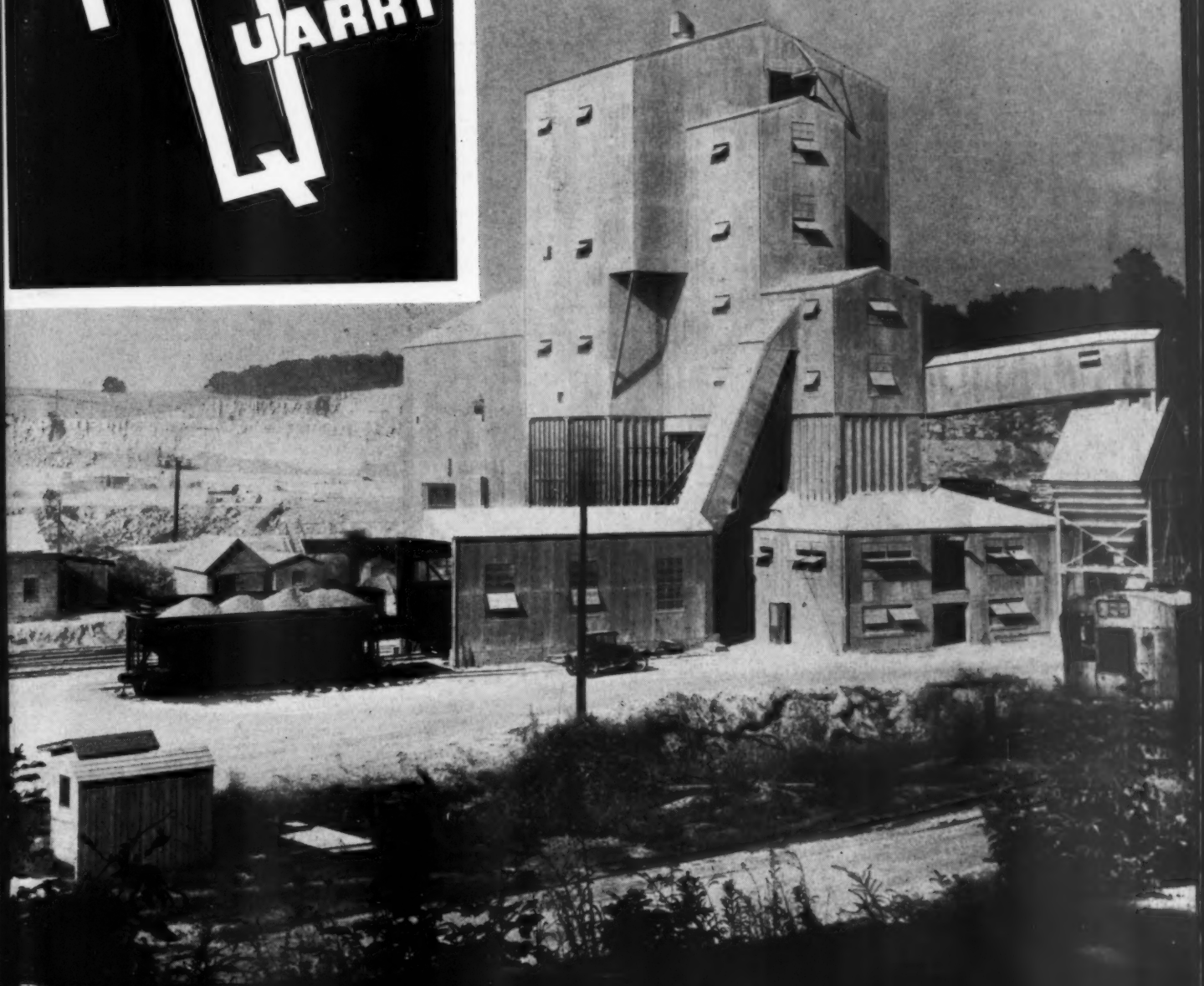
PIT AND QUARRY



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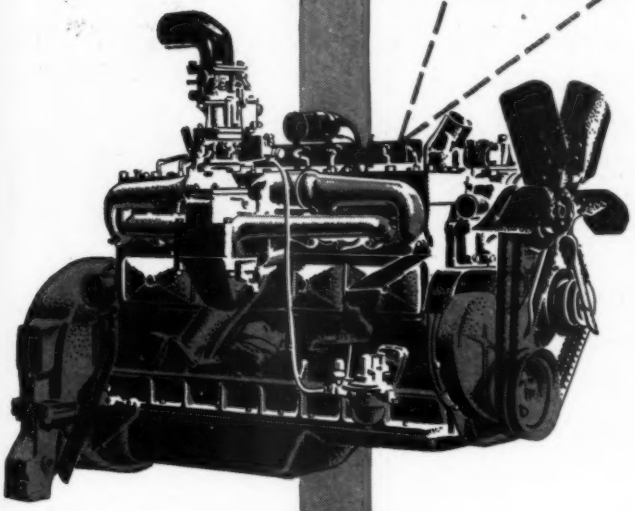

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Vol. 42 NOVEMBER 1948 No. 5

PIT AND QUARRY

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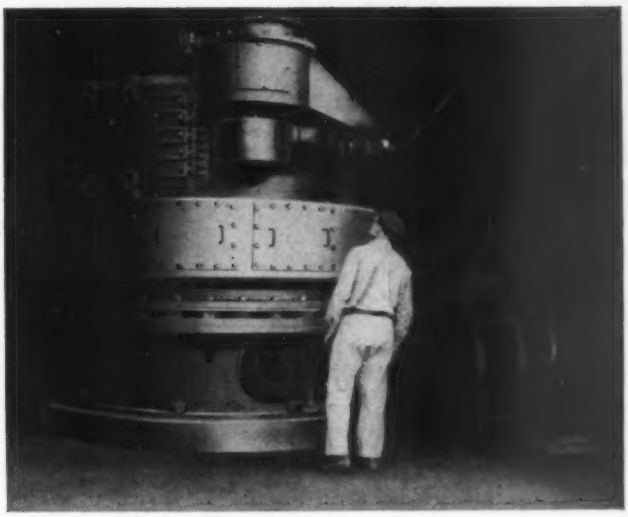

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editorial

Labor Relations—A New Feature

WITH considerable pride and satisfaction we announce to our readers that, beginning with this issue of PIT AND QUARRY, there will be a new monthly page, "Report on Current Labor Developments," by S. Herbert Unterberger. The subject is one of the utmost importance to producers of non-metallic minerals and has heretofore not received the attention it deserves in these pages. Mr. Unterberger is director of research of the Labor Relations Information Bureau of Washington, D. C., an organization of labor experts who plan and conduct studies and provide technical and consultative services for private clients. He is already well known to our readers for his monthly "Washington News Letter," which he will continue to write. His excellent qualifications as an economist and an authority on industrial and labor relations are described in more detail elsewhere in this issue.

In general, the problems of operating a business have become increasingly complicated, particularly over the past decade. Among those problems (production, tax, legal, etc.), none appears to have grown as rapidly, or to the same troublesome extent, as the problem of effectively managing the labor force.

When business establishments were, on the average, smaller, when the power of organized labor was less substantial, and before labor-management relations became the subject of seemingly endless regulations, few labor problems arose; and those that did were disposed of easily—often informally, on the spot, and in the plant. But that is no longer the case. Labor problems have become increasingly complex and they are not solved easily. Advanced managements now devote at least as much attention to the handling of the labor force as to any other operating problem. They know that the profitability of a business will often depend on the skill with which it conducts its labor relations. This is especially true in industries such as the pit and quarry industries, where labor costs constitute so high a proportion of total expenses. The most recent U. S. Census data, for example, show that for the nonmetallic mineral industries, wages constitute almost half of the principal expenses.

The new "Report on Current Labor Developments" will, each month, provide an easily understandable account of items, events, decisions, and regulations about labor matters which are of importance to businessmen generally and to those in the pit and quarry industries in particular. For example, it will report new wage-and-hour regulations and analyze their effect on business operations; it will discuss new matters before the National Labor Relations Board and new decisions of that agency and of the courts in labor cases; it will point out new trends in collective bargaining, in wage movements, in the cost of living, etc. It will cover matters which are of interest and concern to both unionized and non-unionized establishments.

Diversion Rears Its Ugly Head

IN a release based on the detailed report of the Public Roads Administration for 1947 Charles M. Upham, engineer-director of the American Road Builders' Assn., points out that tax diversion, that menace to good roads, is again on the increase. Since 1942, with highway revenues increasing, the volume of funds diverted was reduced each year. In 1947, however, tax diversion was 80 percent higher than in 1946, reversing the 5-year trend. This is something for highway users and builders, and those who supply the materials for them, to think about.

Diversion in 1947 was $170,518,000, about 9 percent of total taxes of $1,903,594,000, which included receipts from motor fuel taxes, vehicle registration fees and other motor carrier taxes totalling $1,838,741,000. The balance came from road, bridge and ferry tolls and other state imposts. This percentage may seem relatively unimportant but it is significant that the increase in diversion occurred in spite of the fact that 20 states in the Union have anti-diversion amendments to their state constitutions which ban the practice, and several other states without such amendments do not practice diversion.

According to Mr. Upham there has been much justification for the belief that diversion was fading. Since a penalty was imposed on states diverting such funds by the Hayden-Cartwright Road Act of 1934, constitutions have been amended in 17 states to prohibit diversion. Only Oregon, Minnesota and Kansas had taken such action prior to this act. Massachusetts will vote on it this year and Tennessee may also.

On the basis of the P.R.A. 1947 figures Rhode Island is the worst offender, with 57 percent; Florida and Georgia each diverted 36 percent of their highway income; other offenders were: New York with 28 percent; California with 25 percent; Texas, 23 percent; Oklahoma, 19 percent; and Tennessee, 17 percent. In fairness to California its diversion is claimed to be only technical as the diverted funds go to counties and are used by them for highway purposes.

There is no defense for diversion. It is simply a political expedient for raising funds for other purposes painlessly. It robs the motorists who pay these taxes of a large percentage of the roads they pay for; and this increase in diversion comes at a time when the need for rehabilitating our roads and streets is particularly acute. This increase was probably only possible because we had smugly assumed that diversion was on the way out and had slackened our efforts to suppress it. It is definitely on the way in again and should be vigorously fought by everyone—highway users, builders, and those who supply the materials for them—and this means practically everyone. The pressure of public opinion should be brought to bear on the legislatures of those states which have no anti-diversion amendments until this practice has been entirely stopped.

Walter E. Trunkey

news of the industry

PIT AND QUARRY

N.L.A. Directors Consider Vital Issues at Sea Island During Fall Meeting

On September 28 and 29 the board of directors and the executive committee of the National Lime Association held their fall meeting at The Cloister, Sea Island, Ga. Plans were made to schedule the 1949 fall meeting about November 1 at this popular resort.

Among the important items on the agenda were a discussion on the effect of the "cement case" decision upon the industry and the association's program for obtaining 15 percent depletion on limestone quarries when the lime is calcined or when used for chemical purposes. On the latter subject plans were considered for presenting the industry's petition to the House Ways and Means Committee after the elections in January. Also under discussion was the program for the National Lime Association's Operating Division meeting, which is to be held on November 4, 5 and 6 at the Palmer House in Chicago. Wallace Wing, chairman of the Operating Division, presented these plans.

A report by Professor K. B. Woods of Purdue University on the recent N.L.A. research fellowship on lime stabilization at Purdue was presented. On the basis of tests made at Purdue it appears that the addition of hydrated lime in varying percentages will reduce the plasticity and increase the strength in varying degrees of a wide range of soils.

W. W. Sprague, chairman of the Agricultural Research Committee, reported on the N.L.A. agricultural fellowships at five state agricultural experiment stations, and also on an agricultural fellowship meeting at College Park, Md., last July. It was agreed that the publication of a new book on liming by the association at the conclusion of this research program would be desirable. Robert S. Boynton, general manager, outlined three books on trade waste treatment, which the association has published or will publish soon.

Chicago Firm Wins Contract For Tex-Mex-Halliburton Plant

MacDonald Engineering Company, construction engineers of Chicago, have been awarded the contract for the construction of the complete new cement plant at Corpus Christi, Tex., for Tex-Mex Cement Company, an Erle P. Halliburton Company subsidiary.

Plans for the $6,000,000 plant were announced several weeks ago, and work on the foundations has already begun.

Coming Events

January 10-14, 1949—Philadelphia. Third National Materials Handling Exposition, Convention Hall.

January 18-20, 1949—Washington, D. C.—Annual convention, National Agricultural Limestone Association, Hotel Statler.

January 31-February 3, 1949—Cleveland. Annual convention and exposition, National Concrete Masonry Association, Cleveland Auditorium.

February 7-9, 1949—New York. Annual convention, National Crushed Stone Association, Hotel New Yorker.

February 13-17, 1949—San Francisco. Annual meeting of American Institute of Mining and Metallurgical Engineers.

February 14-18, 1949—New York. Thirty-third annual convention, National Sand and Gravel Association, Hotel New Yorker.

February 14-18, 1949—New York. 19th annual convention, National Ready Mixed Concrete Association, Hotel New Yorker.

February 21-22, 1949—Chicago. Annual convention, Agricultural Limestone Institute, Edgewater Beach Hotel.

February 22-25, 1949—New York. 45th annual convention, the American Concrete Institute, Hotel Pennsylvania.

General Crushed Stone Co. Winner in Safety Contest—Quarry Injury Rate Rises

The U. S. Bureau of Mines has announced that the Rock Hill quarry of The General Crushed Stone Company, Quakertown, Pa., had the best safety record of the operations enrolled in the 1947 National Crushed Stone Association Safety Competition. This trap-rock quarry won the bronze plaque provided by the *Explosives Engineer* magazine for the outstanding achievement of a period of operation totalling 93,869 man-hours without a disabling injury through 1947. Rock Hill quarry has had injury-free records in five other years of competition and was awarded certificates of honorable mention for these years. The first three ranking crushed stone operations in the 1947 competition were the Rock Hill, Winchester and Auburn quarries of the General Crushed Stone Co. These quarries were operated a total of 244,905 man-hours without disabling injuries.

Despite these outstanding records, the overall injury experience at the 50 crushed stone operations enrolled in the 1947 competition was not favorable. The injury-severity rate of 8.902 days lost per 1,000 man-hours of work was the highest of any of the annual competitions. This high rate resulted primarily from the ten fatalities in 1947, a greater number than in any other year of the contests except 1947, when there were also ten fatalities.

Injury frequency of the competing plants in 1947 was 29.287 per million man-hours. This rate was more favorable than the average of 31.542 for the 22-year history of the contests. However, it was a higher frequency than in 1946 and 1945.

The following plants—all open quarries—received honorable mention for accident-free operation during 1947: Winchester trap-rock quarry, The General Crushed Stone Company, Winchester, Mass., 86,460 man-hours; Auburn limestone quarry, The General Crushed Stone Company, Auburn, N. Y., 64,576 man-hours; Marquette limestone quarry, Marquette Cement Manufacturing Company, Cape Girardeau, Mo., 63,622 man-hours; No. 4 trap-rock quarry, Southwest Stone Company, Knippa, Tex., 55,515 man-hours.

National Gypsum Closes Historic Mine at Akron After 41-Year Operation

The Akron, N. Y., mine of the National Gypsum Co. is being dismantled after more than 40 years. When the last ton of rock had been hoisted up the shaft from mine level 70 feet below, workmen began removing equipment—crushers, pumps, tracks and locomotives. Within a few months, according to Plant Manager Lewis H. Seugert, the three-mile-long mine with its acres of subterranean passages will be sealed permanently as required by state law.

Presence of gypsum under Akron first was discovered in 1903 during experimental drillings for natural gas. It was not until June, 1907, however, that the first mine shaft was sunk and operations were begun. In the intervening 41 years, a total of 3,438,710 tons of gypsum rock has been taken out.

Harry Nobles of Rochester, N. Y., organized the American Gypsum Co. in 1907, started the mine and established a large crusher plant.

In 1923 the American Gypsum Co. was absorbed by the Universal Gypsum Co., which the same year built a plaster mill and a few years later a board plant. The National Gypsum Co., present owners, acquired the mine by purchase from Universal in 1935. In the 13 years of its occupancy, National has mined 1,148,264 tons of rock, or slightly more than one-third of the mine's total for the 41 years.

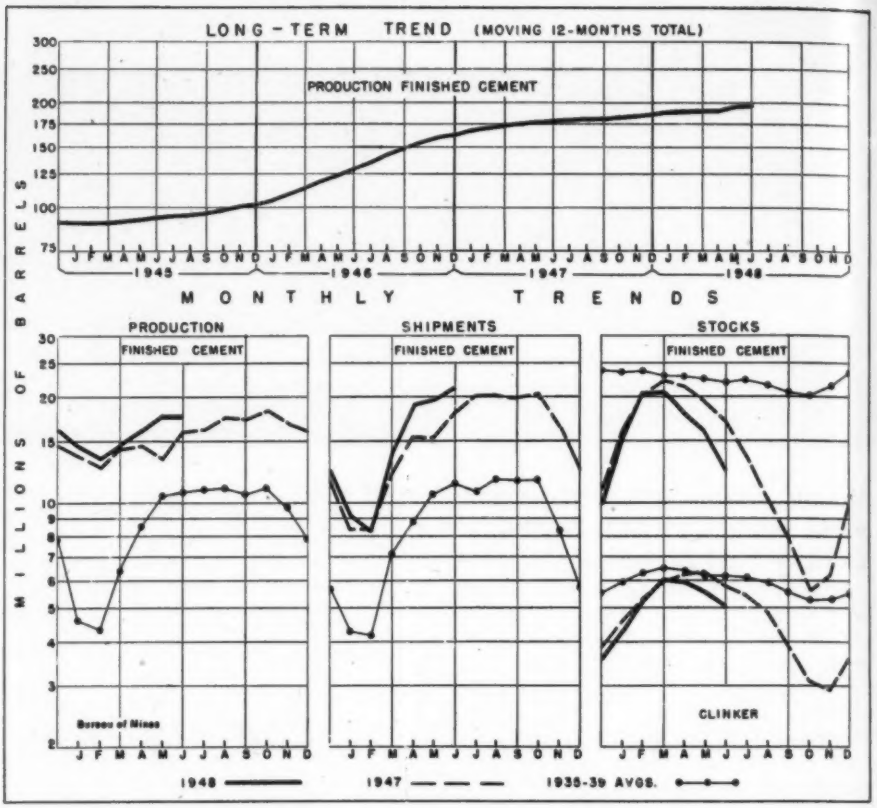
Only the mine itself will be closed; the big gypsum processing plant on the site will continue to operate, receiving its raw materials from National's Clarence Center mine. Personnel released by the mine's closing is being allocated between the two plants and the Clarence Center mine.

The supply of gypsum at the Clarence Center mine, will last at least 100 years, it is estimated.

Three Marquette Plants Win Citations for Safety Records

Marquette Cement Manufacturing Company today received three certificates of achievement in safety from the U. S. Department of the Interior, Bureau of Mines, in recognition of the outstanding record of safety in operations at Marquette Quarries in Oglesby, Ill., Cape Girardeau, Mo., and Earlham, Ia. To achieve this distinction in national safety competition, Marquette men at the Oglesby quarry performed 126,157 man-hours of work without a lost-time accident in 1947. The record of the Cape Girardeau quarry was 63,622 injury-free man-hours during the same period. Marquette Earlham quarrymen hung up a record of 44,960 consecutive man-hour of safe work in 1947.

Four brothers, Maurice, F. K., Charles and W. P. Grinstead, have announced that they will begin operation of a quarry and rock crushing plant near Haddock, Ga., in the immediate future. Production is expected to be about 60 tons per hour.



The portland cement industry produced 17,757,000 barrels of finished cement in June, 1948, as reported to the U. S. Bureau of Mines. This figure is 11 percent greater than that reported for June, 1947. Mill shipments totaled 21,426,000 barrels, an increase of 18 percent above the June, 1947, figure, while stocks of 12,417,000 barrels on June 30, were 27 percent below the June, 1947, totals. Clinker output in June, 1948, amounted to 17,336,000 barrels, representing an increase of 12 percent over the corresponding month of the previous year.

The output of 17,757,000 barrels of finished cement in June, 1948, came from 148 plants located in 33 states and in Puerto Rico, whereas in the same month of 1947, 15,971,000 barrels were produced in 151 plants. Clinker production increased 12 percent over the June, 1947, figure.

Mill shipments, 21,426,000 barrels, increased 18 percent above the June, 1947, figure. The demand for cement in June, 1948, as indicated by mill shipments, continued strong; and the June, 1948, total exceeded the record output of 20,562,000 barrels, reported in October, 1947. With a single exception, all districts show an increase over the June, 1947, shipments. The changes range from a decrease of 9 percent in the Colorado, Wyoming, Montana, Utah, and Idaho district to an increase of 75 percent in the eastern Missouri, Minnesota, and South Dakota district.

Stocks of 12,417,000 barrels of finished cement on June 30 were 27 percent below the June, 1947, figure, while clinker stocks as of the same date amounted to 5,028,000 barrels—a decrease of 12 percent.

The estimated monthly capacity used in June, 1948 (ratio of actual production to producers' rated capacity), was 89 percent, as compared with 81 percent for the corresponding month in 1947. The annual capacity for the 12 months ending June, 1948, was 80 percent, as compared with 74 percent for the same period of the preceding year.

The long-term trend in production of finished portland cement, as indicated in the accompanying chart, continues upward and has passed the 196,000,000 mark.

Pacific Coast Aggregates Ups Dividend, Offers Stock

Pacific Coast Aggregates, Inc., San Francisco, announced plans to raise the dividend on its common stock and offer new common stock to present shareholders. According to President A. K. Humphries, the company intends to increase the dividend on common stock to 8 cents a share quarterly. (The firm has been paying 5 cents a share quarterly for the last three and one-half years.)

Additional common stock will be offered in the ratio of one share for each three shares now held.

In explaining the proposed offering of common stock rights, A. K. Humphries, president, stated that the cash resources and present earnings of the company would not be sufficient to complete the extensive reconstruction and expansion program on schedule and still provide for any substantial additional investment in inventories and accounts receivable. He added that the dividend boost had been made in anticipation of receiving the additional funds through the new stock.

Wyoming Quarries Co. Plant Begins Operations at Lusk

The Wyoming Quarries Co., Inc., began operations at its granite and limestone plant at Lusk, Wyo., in August.

The company is the successor to the Jay Em Stone & Gem Corp., which was reorganized earlier this year. Heavy machinery was installed in July and early August, and a new road was built to the quarry at Rawhide Butte in the Lusk vicinity.

U. S. Engineers Investigate Omaha Aggregate Sources For Work on Three Dams

At Omaha, Neb., the Army Engineers' Missouri River Divisional Laboratory, under the direction of H. L. Weil, is undertaking an extensive investigation of aggregate sources in connection with the concrete to be used in the huge dams—Garrison, Oahe, and Fort Randall—which will span the Missouri.

The design of concrete mixes for river work is entirely a custom job, according to Mr. Weil, since the volume involved is immense, gravel deposits near the dam construction site are relatively few, and there is no margin for error. If certain concrete structures fail, the reservoir pool would have to be emptied while the failure was being corrected. Since it may require more than two years to fill a pool, hydro-electric power and irrigation projects would be held up for at least that long.

Mr. Weil also pointed out that although the Missouri River dams are earthen, each will use a volume of concrete comparable to that which went into the Hoover dam, a solid concrete structure.

In regard to gravel deposits, many contain deleterious material such as rock that is structurally weak, chemically reactive or both. Since gravel is a bulk product, the idea is to get a satisfactory source as close to the scene of the dam construction as possible.

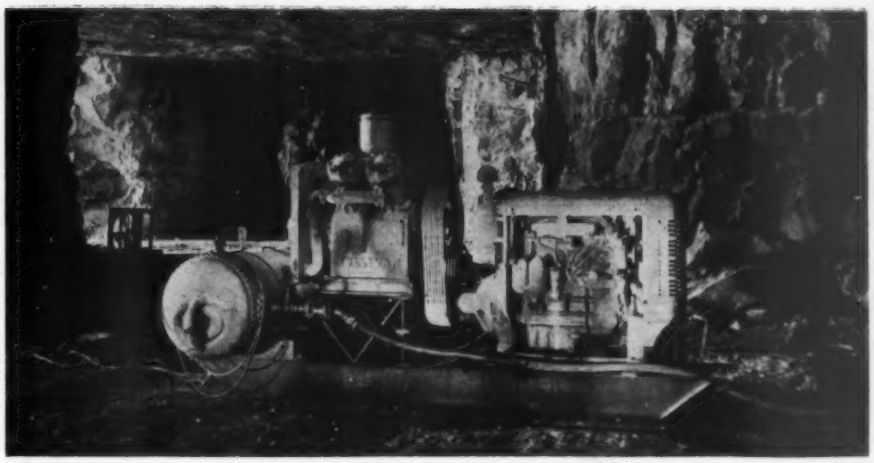
At Fort Randall, for example, the dam will require about 2,250,000 tons of gravel, and engineers are suspicious of local gravel because it is adulterated with lumps of undesirable iron oxide—termed "chocolate drops." Aggregate, consequently, may have to be shipped in from Sioux Falls, S. D., more than 100 miles distant, according to the present outlook. However, spurred by the possible freight savings which would result, the search for satisfactory gravel, or a way to improve it, goes on under Mr. Weil's direction.

McMurdie to Head Section At National Standards Bureau

H. F. McMurdie, authority in the field of microstructure, has been appointed chief of the constitution and microstructure section of the Mineral Products Division, National Bureau of Standards.

Since 1928 Mr. McMurdie has been a member of the bureau's staff. For the past 13 years he has been actively engaged in phase-equilibrium studies of systems involving the refractory oxides and in studies of the constitution and microstructure of nonmetallic mineral products. His application of X-ray diffraction and electron microscopy has resulted in valuable contributions to such diverse fields of science as the composition of inorganic cements and of clay minerals, the chemistry of reactions in dry batteries, and the constitution of rubber. He is the author of numerous papers dealing with X-ray studies of ceramic materials, phase equilibria in portland cement clinker, and microscopic investigation of clay minerals.

Mr. McMurdie is a member of the American Ceramic Society, the American Society for X-ray and Electron Diffraction, the Electron Microscope Society of America, and the Geological Society of Washington.



• Operations at the Warren Limestone Company's underground quarry near McMinnville, Tenn., are considerably expedited by the aid of this skid-mounted Sullivan No. 210 compressor, driven by an International UD-14 diesel engine. It is quickly moved to any point where it is needed. This unit powers the hydraulic drill used to bore blast holes, and is transported by an International TD-9 diesel drawler tractor, which also handles truck loading and stockpiling. Production at this quarry is 700 tons of road and agricultural lime per day.

Robert W. Winters to Succeed Harry O. Warner at Ideal

The appointment of Robert W. Winters as general sales manager of the Ideal Cement Company was recently announced by Claude K. Boettcher, president. Mr. Winters will replace Harry O. Warner, who was formerly general sales manager and a vice-president of the firm. Mr. Warner has a record of more than 33 years of service with Ideal. He will retain his membership on the company's board of directors.

Mr. Winters has had several years of experience in the promotional phase of the cement industry, having been most recently regional manager of the Portland Cement Association.

Robert W. Winters

$600,000 Gypsum Operation To Locate Near Spokane

Spokane County, Wash., recently granted Columbia Gypsum Products, Inc., a special permit to construct and operate a gypsum processing plant in the Spokane Valley on a 72-acre site. An option on a 92-acre tract adjoining the site was also granted. First of the three-unit plant planned by the firm will be a $135,000 pulverizing and bagging plant for the production of agricultural soil conditioner. Later a $65,000 calcining plant will be erected. The third unit, a $400,000 wallboard plant, will require an area of approximately 200 acres.

Supplies of raw material will be shipped to the plant from the company's large gypsum deposit near Windermere, B. C.

Batesville White Lime Quarry Output Leased by Reynolds

Officials of the Batesville White Lime Company, Batesville, Ark., recently completed negotiations with the Reynolds Metals Company of Richmond, Va., which will take over the operation of the lime concern's quarry. (This operation has until recently been managed by the Mullinix Limestone Company of Oklahoma City.) The changeover will be effected before November 21.

According to the terms of the contract, which will run for 15 years, the Batesville firm will furnish a maximum of 500,000 tons of chemical limestone per year for the Reynolds Hurricane Creek operation at Bauxite, Ark. Operations at the quarry will be under the supervision of the Batesville White Lime Company.

Sand-Gravel Production Exceeds 287,000,000 Tons In 1947—California Leads

The production of sand and gravel in 1947, as reported to the U. S. Bureau of Mines, totaled 287,659,000 short tons, valued at $216,869,000. These figures represent an increase of 13 percent in quantity produced and 27 percent in value over the 254,131,000 tons valued at $171,386,000 reported in 1946. Approximately 74 percent of the total production was supplied by commercial plants and 26 percent by federal, state, county, and municipal governments. The largest increase in sand was for fire or furnace use, and in gravel for railroad ballast.

California, in 1947 as in 1946, was the largest producer and Michigan, Wisconsin, Illinois, Ohio, New York, Minnesota and Texas followed in that order. These 8 states, each with an output of more than 13,000,000 short tons, accounted for approximately 48 percent of the total production.

Sales by commercial producers in 1947 amounted to 212,562,417 short tons, representing an increase of about 11 percent over the 192,092,566 tons produced in 1946. Sales in 1947 of all kinds of sands by commercial producers, with the exception of engine and other (miscellaneous), increased over those reported for 1946. Sales of gravel by this class of producers showed increases in every type of use. The combined total of sand and gravel used on government-and-contractor operations also showed an increase over the preceding year. The total output of the industrial sands in 1947 continued strong, and the outlook for the future appears good.

Sales of glass sand totaled 5,321,247 short tons (average value of $2.14 per ton), an increase of 10 percent in production over the 1946 figure. Leading producing states in the order named were Illinois, West Virginia, Pennsylvania, Missouri, and New Jersey.

The output of molding sand was 8,308,434 short tons, representing an increase of 19 percent over the 1946 figure. The average value was $1.44 per ton. Michigan, New Jersey, Illinois, Ohio, and New Work were the leading producing states.

Sales of grinding and polishing sand (including blast sand) increased approximately 21 percent, reaching 1,099,253 short tons (averaging $1.64 per ton). The largest output by states came from Pennsylvania, Michigan, Missouri, Illinois, and New Jersey.

Production of fire or furnace sand increased approximately 50 percent. States leading in production were Indiana, Ohio, Nebraska, Illinois, and Pennsylvania.

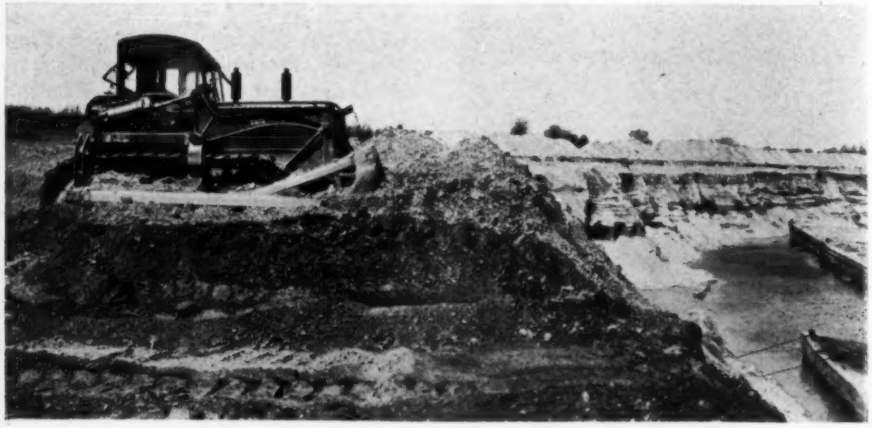
Production of engine sand decreased about 4 percent and totaled 2,683,333 short tons averaging 78 cents per ton. West Virginia, Pennsylvania, Indiana, Illinois, and Virginia were the chief producing states.

There was a 34 percent increase in the output of filter sand. Production amounted to 211,646 short tons, with an average value of $1.73 per ton. Leading producing states were New Jersey, New York, Michigan, Ohio, and Iowa.

Washed, screened, or otherwise prepared sand and gravel comprised 91 percent (192,619,538 short tons) of the total commercial production. The average value was 89 cents per ton, as compared to 51 cents for unprepared material.

Ninety-five percent (202,325,533 tons) of the total commercial production was covered by figures representing methods of transportation; of that output 53 percent was moved by truck, 38 percent by rail, and 9 percent by waterway. When government-and-contractor output, which is commonly moved by truck, is added, the percentages become 66, 27, and 7 percent, respectively.

The output of sand and gravel from non-commercial or government-and-contractor operations in 1947 accounted for 26 percent of the total tonnage, as compared with 24 percent in 1946. The value of this tonnage in 1947 represents 16 percent of the total value for sand and gravel produced by the industry.



• Working at the Construction Aggregates Corporation's plant at Ferrysburg, Mich., this Bucyrus-Erie bulldozer is shown pushing gravel over a bank within range of a shovel which loads it to barges. In addition to feeding the shovel, the unit is used for stripping overburden.

Two Plants of Ideal Cement Win Boettcher Trophy For 1947 Safety Records

Employees at two of Ideal Cement Company's plants—Devil's Slide and Trident—participated in separate ceremonies at which the Charles Boettcher Annual Safety Award was presented for perfect safety records during 1947.

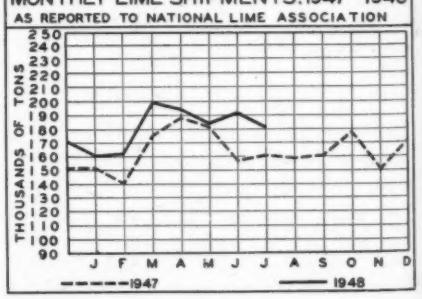
At Devil's Slide (Utah) about 400 persons, including employees and their families, had gathered for an afternoon of outdoor sports. After the supper the award was presented by Chris Dobbins, executive vice-president and general manager. James G. Connell, plant superintendent, accepted the trophy and turned it over to Lawrence Bell, general foreman and head of the plant safety committee.

Because Trident's employees tied with the Devil's Slide staff, also making a 100 percent safety score, a second trophy was presented at the Montana plant. The presentation took place after the picnic supper, with Mr. Dobbins in charge. Victor Adams, a member of the safety committee, accepted the trophy.

Plant Ordered to Close Down Because of Dust Nuisance

By order of the Cambria County court in Pennsylvania, the $125,000 asphalt manufacturing plant of the Interstate Amiesite Company is to remain closed on complaints of residents that it creates too much dust.

The company has spent $17,000 on equipment for dust control since the first court order was issued a year ago, but after a trial run witnessed by Judge George W. Griffith, its request to reopen was denied. The concern operates 11 plants in Pennsylvania, Maryland and Virginia.



According to data collected by the National Lime Association, 45 companies in July, 1948, shipped 180,842 tons of lime (107,955 quicklime; 72,887 hydrate). Reporting companies represent 51.9 percent of the association members' total capacity of record. Based on Pit and Quarry's estimates for the remainder of the industry, the total shipments for the month by all plants were approximately 383,300 tons. Shipments by uses and grades for July, 1948, were:

	Quicklime (tons)	Hydrate (tons)
Agricultural	263	7,925
Building	12,177	41,759
Chemical	95,514	23,202
Totals	107,955	72,887

A.S.T.M. Issues Calendar Of Meetings for 1949— Spring Session at Chicago

Dates of 1949 meetings of the American Society for Testing Materials were recently made public. The first scheduled will convene on February 28 at the Edgewater Beach in Chicago. This will be the spring meeting and A.S.T.M. Committee Week; sessions will run through March 4.

The fifty-second annual meeting will be held at the Hotel Chalfonte-Haddon Hall at Atlantic City, June 27 to July 1, inclusive. A.S.T.M. will hold its first West Coast meeting October 10 to 14, inclusive, at the Fairmont Hotel, San Francisco.

R. E. Jones Succeeds Swiggett At Lehigh's Iola, Kan., Plant

R. N. Young, vice-president and operating manager of the Lehigh Portland Cement Company, has announced the promotion of Robert E. Jones to the post of plant manager at Iola, Kan., to succeed C. A. Swiggett, who has retired. Mr. Jones comes to his new duties from Lehigh's plant at Buffalo, N. Y., where he was assistant plant manager and supervising chemist. Before joining Lehigh he was supervisor of operations at the Trojan Powder Company's plant at Lawrence, Kan.

Mr. Swiggett had been plant manager at Iola since 1917. From 1910 to 1916 he had been assistant superintendent. For one year thereafter he served as superintendent of the Western States Portland Cement Company's plant at Iola, but returned to Lehigh to become superintendent in 1917. He received his training in mechanical engineering at Wichita University and the University of Kansas.

Under his guidance an unbroken safety record extending from 1927 through 1938 (totalling 3,579,883 man-hours) was established at the Iola plant. During this period not one lost-time accident was recorded.

Joint Co-operative Committee Formed by A.G.C. and Engineers

R. E. Dougherty, New York, N. Y., president of the American Society of Civil Engineers and Dwight W. Winkelman, Syracuse, N. Y., president of The Associated General Contractors of America, announced that both organizations had approved the establishment between them of a National Joint Cooperative Committee.

The purpose of the committee is to study matters of mutual concern to civil engineers, general contractors, and the public, with the view of recommending procedures for carrying out construction more economically.

Earlier in the year a similar national joint cooperative committee was established by The Associated General Contractors of America and the American Institute of Architects. Two other organizations with which the A.G.C. maintains similar committees are the American Association of Highway Officials and Associated Equipment Distributors.

4,000,000 Tons of Rock Rides on 7-Mi. Coaster To Bull Shoals Site

The country's longest commercial roller coaster, a seven-mile belt conveyor, has begun the two-year job of transporting 4,000,000 tons of crushed rock used in the construction of the giant Bull Shoals Dam on White River. The machinery for the conveyor was designed and manufactured by Hewitt-Robins Inc., of Passaic, N. J.

In pointing out the technical problems which had to be overcome for the monumental task, Hewitt-Robins engineers said that the conveyor consisted of 13,888 rollers, each made up of three tube-shaped steel pulleys. The machinery supports 21 separate belts. In this fashion the rock travels from the conveyor-head at Flippin, Ark., over the rugged Ozark hills at the rate of 525 feet per minute. It moves 650 tons of crushed rock every hour to the dam site.

Construction of the $58,000,000 dam will require 4,000,000 tons of rock, 1,800,000 barrels of cement, 1,500 workers, and 5 years of construction time.

Marquette, Pittsburgh Plate Glass Plants Win Safety Awards

The Memphis, Tenn., plant of the Marquette Cement Manufacturing Company at Crystal City, Mo., won top safety honors in the 19th annual National Sand and Gravel Association Safety Competition, conducted by the U. S. Bureau of Mines. Bronze trophies, provided by *Rock Products,* were awarded to these plants for the best records during 1947 in each of two groups of sand-and-gravel plants.

The Marquette plant, a wet operation, entered in the first group—plants working 100,000 or more man-hours—established the following record: no disabling injuries in a total worktime of 126,483 man-hours in 1947. This plant has won the bronze trophy for four years—1937, 1940, 1945, and 1947—and has been awarded certificates of merit for accident-free operation two other years.

Among plants in the second group—plants working less than 100,000 man-hours—the Pittsburgh Plate Glass plant, a combined wet-and-dry operation, won the trophy award, for an injury-free record during a total work-time of 88,238 man-hours during 1947. It was the first year the plant had been enrolled in the contest.

In all, 68 sand-and-gravel operations participated in the 1947 competition. There were 132 disabling injuries at these plants during an aggregate of 4,685,976 man-hours of work. The injury-severity rate of 3.338 days lost per 1,000 hours of work showed considerable improvement over the rate of 5.584 in 1946 and was also better than the average of 4.672 for the 19 years of the competition.

Accident-free records in 1947 were hung up by the following plants:

Dividing Creek wet-pit plant, South Jersey Sand Company, Dividing Creek, N. J.—67,275 man-hours
Circleville wet-pit plant, The Sturm & Dillard Company, Circleville, O.—49,704 man-hours
Portland dry-bank plant, Portland Sand & Gravel Co., Portland, Pa.—41,716 man-hours
Thomas wet-pit plant, Fort Worth Sand & Gravel Co., Birdville, Tex.—41,674 man-hours
St. Joseph river plant, Pioneer Sand Company, St. Joseph, Mo.—40,943 man-hours
Fort Jefferson dry-pit and wet-pit plant, American Aggregates Corp., Fort Jefferson, O.—37,810 man-hours
Correctionville dry-pit plant, Concrete Materials Co., Correctionville, Ia.—34,286 man-hours
Maxwell wet-pit plant, American Aggregates Corp., Indianapolis, Ind.—33,306 man-hours
Sierra dry-pit plant, Consolidated Rock Products Co., Monrovia, Calif.—31,009 man-hours
Monmouth dry-bank plant, Maine Sand & Gravel, Inc., Monmouth, Me.—30,897 man-hours
Erie lake plant, Erie Sand & Gravel Company, Erie, Pa. — 28,578 man-hours
Hewitt dry-bank plant, Consolidated Rock Products Co., North Hollywood, Calif.—28,415 man-hours
South Bend dry-bank plant, South Bend Sand & Gravel Corp., South Bend, Ind.—22,072 man-hours
Trenton dry-pit plant, Eastern Rock Products, Inc., Barneveld, N. Y.—18,908 man-hours.
Cleveland dry-bank plant, The Schmidt Bros. Sand & Supply Co., Cleveland, O.—17,740 man-hours
Wilton dry-bank plant, Hudson Valley Sand & Stone Company, Wilton, N. Y.—16,664 man-hours.
Maiden Rock dry-tunnel plant, Maiden Rock Silica Sand Co., Maiden Rock, Wis.—11,486 man-hours
Camden wet-pit plant, White Gravel Company, Camden, O. — 11,076 man-hours

On the subject of the causes of the 132 lost-time or disabling accidents, the report indicated that 52 percent were due to falls of persons, handling objects, and machinery. Accidents involving falls of persons were more severe than any other listed.

Action Urged on Case of Guiberson vs. Palm Springs To Speed Court Decision

Prompt action on a suit filed by S. A. Guiberson Jr., head of the Guiberson Whitewater Cement Co., seeking permission to construct a $10,000,000 portland cement plant near Palm Springs, Calif., is urged by William C. Dixon, in charge of the Pacific Coast anti-trust division of the U. S. Department of Justice.

Mr. Dixon filed a declaration in Federal court in Los Angeles on October 13 that the public interest demands an early determination in the case, which seeks an injunction restraining Riverside County from enforcing a recently-enacted zoning ordinance barring the plant. The ordinance was passed on complaint of Palm Springs, famous winter desert resort, that the dust nuisance resulting from the operation of the plant would be harmful to the interests of the resort and its property owners. Expert witnesses for the Guiberson interests had declared, however, that modern equipment to be employed in the plant would eliminate any such hazard.

Mr. Guiberson purchased the property from the War Assets Administration for $100,000 and asserts that he has contracted for the purchase of $1,000,000 worth of machinery and equipment to begin erection of the proposed cement plant.

$1,500,000 Phosphate Plant To Open at Wendell, Idaho

At Wendell, Idaho, a $1,500,000 plant for processing phosphatic rock was recently completed for the Idaho Farm Bureau Federation and Gates Brothers, Inc. Processing will be carried on by the latter firm and distribution will be made through the federation.

An announcement released by both groups stated that the federation has 5,640 acres of phosphate lands under lease, while Gates Brothers has 2,000 acres—all in the section near the Idaho-Wyoming-Utah boundary.

Canadian Johns-Manville Co. Operating New Rock Wool Plant

Production has been under way for several weeks at the rock wool division of the new Canadian Johns-Manville plant at Port Union, Ont., near Toronto.

According to Earle C. Brockett, vice-president, full operation of the new plant will mean a saving of several million American dollars a year to Canada, which has an acute dollar exchange problem.

12-Mile Conveyor to Carry 5,600,000 Tons of Aggregate

Approximately 5,600,000 tons of sand and gravel will be transported from deposits to the site of the $100,000,000 Hungry Horse Dam, five miles away, next summer. The huge project, under the supervision of the U. S. Bureau of Reclamation, will span the Flathead River near Devil's Elbow, Mont.

Winner of the contract for the 12 miles of the main conveyor belt is the United States Rubber Company, which will supply ten 30-in. sections, each a mile in length, as well as two miles of belts in miscellaneous sizes. All of the belting will be produced at the company's Passaic, N. J., plant.

Hungry Horse Dam will have a reservoir capacity of 3,500,000 acre feet and will be 520 feet high. More than 3,000,000 cubic yards of concrete will be used in its construction. Installation is expected to be completed by next summer.

Railroads Ordered to Establish New Gypsum Shipping Rates

A complaint of the United States Gypsum company against rates charged by the Pennsylvania Railroad, the Baltimore & Ohio Railroad and other Eastern lines was upheld by the Public Utility Commission. The company stated that rates charged were unlawful because they were "unreasonable, discriminatory and too numerous."

The Public Utility Commission ordered the railroads to establish new rates by October 22, applying rates in cents per pound to the shipment of gypsum.

Marquette Packaged Cement Is Shipped by Rail to Chicago

Under a new plan recently inaugurated by the Marquette Cement Manufacturing Company, cement is now packaged at the Oglesby, Ill., plant and shipped to Chicago by rail, instead of being sent by barge and sacked at the destination.

Other cement firms are packaging their product in Chicago to secure an f.o.b. Chicago price; but Marquette officials say that the company meets the competitors' price in the area despite packaging at Oglesby.

• Pit and Quarry heartily endorses the 1948 Christmas seal campaign of the National Tuberculosis Association and its 3,000 affiliates, which are waging an all-out war against this dread disease. Proceeds of the campaign will be utilized for educational activities, case-finding, rehabilitation and medical research.

1947 Gypsum Output Tops All Established Records as Yield Hits 2,157,049 Tons

Production, imports, and value of sales of gypsum topped all established record highs in 1947. Mine output rose to 6,208,216 short tons, 10 percent over 1946; imports increased 48 percent to 2,157,049 short tons, and value of sales amounted to $128,181,671—32 percent above 1946. The United States was the largest producer of crude gypsum, accounting for over 40 percent of the estimated world total.

Crude gypsum was mined from 63 operations, of which 36 were open quarries, 19 underground mines, and 8 quarry-mine combinations. Fifteen of the 17 producing states increased production over 1946; in two states (Michigan and Virginia) production was lower. Michigan was the leading state, followed by New York, Texas, California, Iowa and Nevada.

The apparent consumption of gypsum for all purposes increased 21 percent over 1946. Prefabricated products accounted for about 43 percent of the total tonnage used, building plasters 29, uncalcined uses 25, and industrial uses 3 percent.

Throughout 1947 the gypsum industry has continued to modernize older plants and to construct new ones in an effort to supply the urgent demands of the building industry. There were 211 active calcining units in operation during the year, of which 174 were kettle-type, 14 rotary kilns, and 23 other types. Ten companies operating 41 board machines during the year produced nearly 4,000,000,000 square feet of board (including lath wallboard, sheathing and laminated board), an average of 94,000,000 square feet per machine per year.

The average value reported for crude gypsum mined in 1947 was $2.66 (1946—$2.21). Calcined gypsum value rose from $7.02 in 1946 to $7.72 in 1947.

New Sand Washer Installed In San Joaquin Valley Area

In order to keep pace with the increasing demand for sand and gravel in the San Joaquin Valley, the Thompson Materials and Construction Company has installed a large sand-washing plant at its plant near Coalinga, Calif. It is said to be the first of its kind in this area.

The new plant is a screw-type washer capable of washing 30 tons of construction sand per hour. Ahead of the washer is a Symons vibrating screen for sizing the feed. Other new equipment recently installed included a 100-ton Noble batch plant and a 500-bl. bulk cement silo.

Thompson operations also include four batching plants, among which eight 4-cu. yd. transit mixer trucks do shutttle service.

The United States Gypsum Company's plant west of Loveland, Colo., was reopened for business early in October. The plant was badly damaged by fire on June 20, 1948.

A Letter from a Reader

Dear Mr. Trauffer,

I have read with interest Mr. Phillipp's article on the Technical Laboratory of the Swiss Cement Industry, appearing in your August issue.

PIT AND QUARRY is doing its American readers a service by featuring articles of this nature, focusing attention on developments in other countries.

In this instance, Mr. Phillipp wrote a good review of the activities and methods of the Swiss Laboratory. However, his comparison of the standards of quality between the Swiss and the United States specifications for portland cement gives the erroneous impression that higher standards are maintained in Switzerland, while the opposite is true.

He reports that the strength requirements are, roughly, 50 percent higher in the Swiss specifications and takes this as an indication of a higher standard. He does not mention the biggest single factor causing this difference in strength—more water in the U. S. mortars. The strengths of cement sand mortars also conform to the water-cement ratio law. Swiss specifications require a fixed amount of mixing water of 11 percent by weight of total dry materials which is equivalent to 4.97 gallons per bag of cement. The standard American mortar uses a water content of approximately 5.7 gallons per bag of cement, or .7 of a gallon more per bag of cement than that specified for the Swiss. This .7 gallon per bag of cement represents a strength difference of about 1000 p.s.i. at 7 days and about 1300 p.s.i. at 28 days. Correcting the U. S. requirements for the lower water cement ratio specified by the Swiss, it will be found that the American requirements are higher than those of the Swiss.

A further incorrect conclusion as to the standards of quality is arrived at by the author when he states as follows:

"That higher standards are maintained is also indicated by the amount of insolubles permissible. Sulphates, $CaCO_3$ and MgO are kept to a minimum of 10 percent as compared to about 16 percent allowable in the U. S. cements."

Mr. Phillipp in this case misquotes the Swiss specification by including the magnesia in the 10 percent limit and overstating comparable U. S. allowables. According to the Swiss specifications the cement may contain:

Item No.	30%	Tolerance %
1 Magnesia (MgO)	4	(Max. 5.2)
2 Gypsum (SO_3=2.5%) CaSO	4¼	(Max. 5.5)
3 Insoluble + $CaCO_3$	.5	(Max. 6.5)

The sum of gypsum as $CaSO_4$ plus insoluble plus calcium carbonate must not exceed 10 percent (Items 2 and 3 only).

American specifications limit the magnesia to 5 percent, which is .2 percent less than the maximum Swiss tolerance. Gypsum is limited through a specified SO_3 content, being 2 to 4¼ percent for Type I cement, while the insoluble is held to a high of .75 percent. Limestone and other diluting admixtures are not permitted at all. Certain specially tested and approved additions are limited to 1 percent. The U. S. chemical percentages to be used by Mr. Phillipp for comparison are:

Gypsum as CaSO	4.25 percent
Insoluble	0.75 percent
Special additions	1.00 percent
	6.00 percent

Thus it is seen that the U. S. limits are 4 percent under the 10 percent maximum set by the Swiss, and closer restrictive control is indicated for U. S. cements.

Very truly yours,
E. Gruenwald,
Manager, "Incor" & Technical Service

Highway Research Board Plans 28th Meeting at Washington

The 28th annual meeting of the Highway Research Board will be held this year from December 7 through the 10th at the building of the National Academy of Sciences and National Research Council, 2101 Constitution Avenue, Washington, D. C.

It is expected that this meeting will exceed in attendance the annual meeting of the board held in Washington last December, when 853 persons registered, and 125 technical papers and reports were presented and discussed at 24 separate public sessions. Thirty-six state highway departments, 31 colleges, 26 government bureaus and 33 national associations were represented.

127-Foot Conveyor Stockpiles River Sand at Missouri Plant

Pictured below is a stockpile tubular frame conveyor recently built for the St. Charles Sand Co., St. Charles, Mo. The 127-ft. unit, supplied by the E. F. Marsh Engineering Co. of St. Louis, Mo., was assembled on the ground and erected by two cranes. A movable plow sweeps the material from the belt. It can be used at any point on the frame and, for the operation, replaces one troughing idler. The sweep unit (self-contained) employs four flat idlers, and the plow is equipped with soft gum rubber, which is adjustable for belt contact and wear.

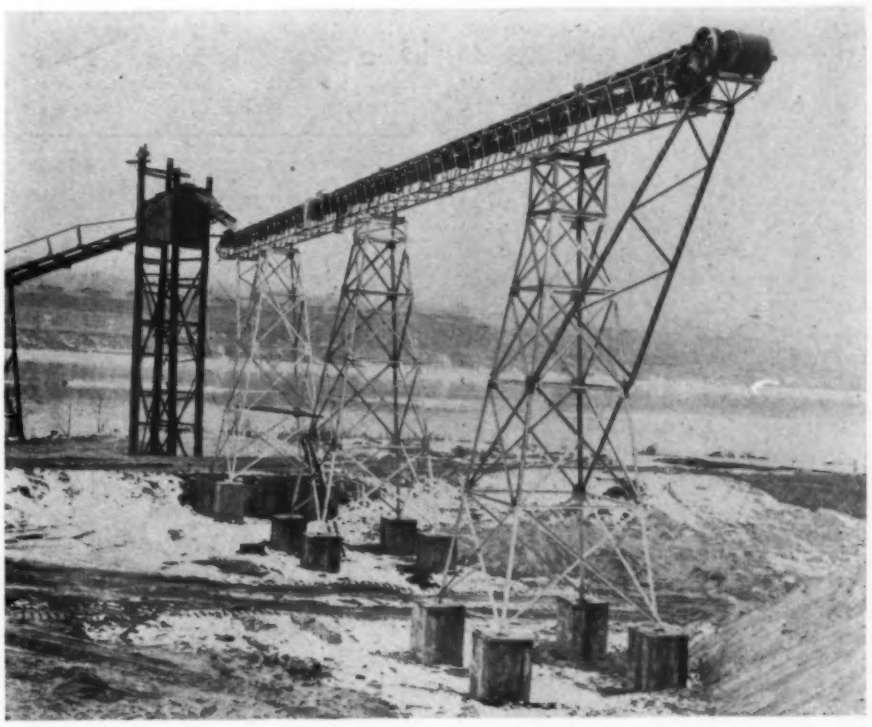
The intake or receiving end is approximately 35 ft. from the ground and is inclined at 5 degrees from horizontal. Material is chuted into a hopper which positions it correctly on the belt. Supports are spaced at approximately 40 ft. Sand from the river is brought to a transfer point by conveyor. Three sizes are stored on the ground for recovery by tunnel conveyors.

The unit at this plant will eventually be extended to approximately 225 ft. to service additional area for ground storage.

United States Perlite Co. Now Conducting Experiments

A newly organized concern in the Los Angeles area is that of the United States Perlite Company. This firm's mining properties are located in the Goodsprings area of Nevada, and its experimental furnace at Los Angeles.

Officials stated that they do not plan to process the perlite for the commercial market but to offer their patented furnace on a royalty basis and promote the sale of their ore. The company is at present constructing a new furnace of commercial size which will be in operation in the near future.



• The 127-ft. conveyor used for stockpiling at the plant of the St. Charles Sand Co., St. Charles, Mo.

30 years ago in Pit and Quarry

By WALTER E. TRAUFFER

ALMOST prophetically, the theme of the November, 1918, issue of PIT AND QUARRY, the last before the end of World War I, was the necessity for post-war planning. In an editorial and in several articles it was forcefully pointed out that with the end of the war there must be a vast highway and building construction program. The war, it said, proved the importance to a nation of an adequate highway system; and the large and growing backlog of needed residential and industrial construction would also require immediate attention.

In another editorial it was suggested that the national associations of the gravel and stone industries, unified for the duration of the war through the War Service Committee on Mineral Aggregates, hold a joint meeting. It was pointed out that many advantages could be gained by intelligent cooperation of the two groups and industries.

Association doings covered in that issue included the permanent organization of limestone producers in Tennessee, North and South Carolina, Georgia, Florida and Alabama as the Southern Agricultural Limestone Assn.

Also described was the first meeting of the executive committee of the Michigan Sand & Gravel Producers' Assn. One item discussed was the proposed joint meeting of the officers of the Ohio, Indiana, Illinois and Michigan associations. John S. Porter was engaged temporarily as acting executive secretary.

As usual, there were several outstanding practical operating articles. One described and illustrated all the modern methods of quarrying with explosives, including well-drilled shots, benching, tunneling, snake-holing, etc.

Another article described ways of conserving coal in power plants, vertical and rotary kilns, driers, etc. It was pointed out that the use of pulverized coal effected many economies, and its growing use in the field was predicted.

Labor-Saving in Limestone Quarrying was the subject of the first of two articles by Oliver Bowles. He covered the subject thoroughly, discussing quarry planning, overburden removal, etc., and comparing various methods. Labor saving and economy were stressed.

Two types of sand production on Lake Erie were described. The Kelley Island Sand & Gravel Co. operated from sand dredge boats which pumped sand from bars in various parts of the lake and screened it before delivering to shore yards. Each boat was equipped with 10- and 12-in. pumps; the largest had a capacity of 1,250 tons.

Also featured were the operations of the DoVille Lake Sand & Gravel Co., Toledo, Ohio, which in 1882 began producing lake sand and gravel by means of suction dredges. The steamer *R. R. DoVille,* built in 1905, was said to be the first steel sand boat on the Great Lakes.

The 4,000-ton-per-day crushed stone plant of the France Stone Co. at Monroe, Mich., one of 14 then operated by that company, was the subject of another story. An unusual feature in this plant was a 48-in. by 90-ft. pan conveyor which carried rock from the primary crusher to the first set of screens.

National Gypsum's Earnings Show Consistent Increase

The National Gypsum Company reported a net income of $3,337,537, or $1.49 a share on 2,112,336 outstanding shares, for the six months ended June 30. This compared with $2,531,446, or $1.39 a share on 1,689,869 outstanding shares, in the first half of 1947. Record sales in the first half of 1948 were $31,896,306, as compared with $23,998,469 in the corresponding six months a year ago.

For the second quarter of 1948, the company had a net profit of $1,815,604, or 81 cents a share, as compared with $1,216,829, or 66 cents a share, in the same quarter last year. Sales in the second quarter of this year hit a new record of $16,508,292; during the comparable period last year they amounted to $12,378,574.

"With plant construction practically completed," President Melvin H. Baker said in a report to stockholders, "expanded capacity and continued demand for our products should result in a further increase in sales during the next six months."

Blast Causes Heavy Damage As Quarry Charge Misfires

Damage estimated at several thousand dollars resulted from an explosion which rocked the quarry and plant of Dunn Limestone Company near Spencer, Ind., on August 23. The blast, attributed to a dynamite misfire, fortunately occurred at noon, when most of the employees were at lunch. Donald D. Ellis suffered minor back injuries.

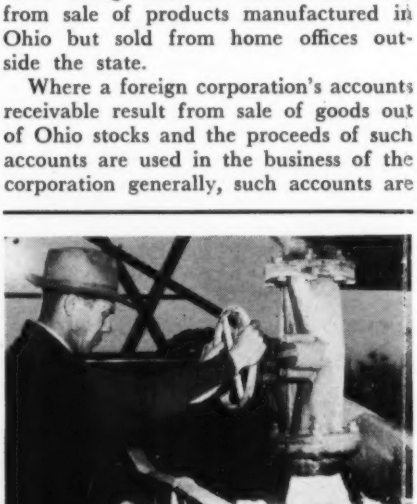
The explosion sent huge boulders into the air and ripped the top from a storage bin; it also damaged machinery and destroyed the main office building.

Court Rules U. S. Gypsum Co. Must Pay Intangible Tax

Ohio's Supreme Court ruled in five test cases, including two involving the United States Gypsum Co., that the state intangible tax may be imposed on accounts receivable of foreign corporations doing business within the state from sale of products manufactured in Ohio but sold from home offices outside the state.

Where a foreign corporation's accounts receivable result from sale of goods out of Ohio stocks and the proceeds of such accounts are used in the business of the corporation generally, such accounts are subject to the Ohio intangible tax of 3 mills, the court held.

Indications were that the opinion would be appealed to the U. S. Supreme Court.



• This rubber-lined Goodrich valve shown in operation (above) has handled approximately 21,000 tons of silica sand suspended in water during the last six months in an Ohio silica sand quarry. The rubber-lined valve was installed after the abrasive action of the sand had worn out ordinary 6-in. cast iron valves so swiftly that it impeded operation of the quarry.

Chicagoan Makes Lucky Guess In Asphalt Institute Contest

If you visited the display of the Asphalt Institute at the Road Show in Chicago last July, you no doubt saw the specimen of heavy-duty hot-mix asphaltic concrete, cut from the superhighway pavement on the Maine Turnpike. You observed the invitation to guess the weight of that slab.

If you guessed 135.605 pounds, you were only second-best guesser, for the lucky contestant who came nearest the actual weight—135 pounds 10 ounces—was T. A. Hallet of the *Inland Printer* (Chicago, Ill.), who put down 135.61 pounds.

Permanente "Supe" Famed For Safety Record Resigns

W. J. "Bill" Knuth, quarry superintendent since September, 1939, for the Permanente Cement Co., Permanente, Calif., has resigned to enter the field of gold mining in the California Mother Lode country.

While at Permanente he established an enviable quarry safety record, operating his department for 2,139 days without a lost-time accident. For this achievement the department earned the Joseph A. Holmes Safety Award seven straight years, 1941 to 1947 inclusive.

WASHINGTON NEWS LETTER

By S. HERBERT UNTERBERGER

Most of official Washington has "hit the campaign trail" and, barring unexpected international developments, will stay on it until after the November elections. The boys have gone home to tell the folks about their own virtues and their opponents' vices. How many of them will be required to stay at home after the ballots are counted is still anybody's guess. As is traditional in elections occurring in prosperous times, each party is claiming credit for the prosperity and blaming the accompanying inflation on the other. If business men in some parts of the country are wondering why the terrific prosperity, so widely heralded, has by-passed them, some figures recently released by the Department of Commerce, which could never aspire to headline prominence, may prove illuminating.

There are various measures of prosperity, but none so widely used as the size of the national income, which is composed principally of income payments of individuals. It is almost axiomatic that high and rising individual incomes are associated with prosperity, while low and falling individual incomes are associated with depression.

A glance at the following table show. how the unprecedented wartime and post-war prosperity developed and how it was distributed. From 1940 to 1944, the most active wartime years, income payments to individuals increased by 100 percent, that is, doubled, in the United States as a whole. In the years 1944 to 1946, they increased another 13 percent and from 1946, they increased another 13 percent and from 1946 to 1947 another 11 percent increase took place. To be sure, much of these increases were eaten up by inflation; nevertheless, the fact that an unexpected prosperity has overtaken us can not be gainsaid.

Total Income Payments to Individuals by Region—1940-1947

Region	Percent increase in total income payments		
	Between 1940 and 1944	Between 1944 and 1946	Between 1946 and 1947
Total United States....	100	13	11
New England.	75	13	9
Middle East..	73	16	11
Southeast....	137	10	9
Southwest....	137	7	15
Central.....	93	15	12
Northwest....	123	13	20
Far West.....	149	10	7

Source: U. S. Department of Commerce.

Further inspection of this table will provide an insight into how very differently this prosperity has affected different parts of the country. During the busiest war years the principal advances, incomewise, were made not in industrialized New England nor the Middle Eastern states, but rather in the Far West, the Southwest, and the Southeast. In these areas that government funds poured into large expansions of manufacturing facilities, such as aircraft plants, and into military installations. The already industrialized areas required no similar multiplication of capital equipment and, being highly populated, they were undesirable locations for army training centers. In addition, the increased demand for agricultural products also favored these same areas—even cotton prices revived to rejuvenate the Southeast. The Central states with their diversification between agriculture and industry approximated the average most closely.

In the postwar reconversion period, New England, the Middle East, the Central states and the Northwest fared better than the rest of the country in terms of increased incomes. In the first three of these areas, so-called non-war production continued to be of substantial importance throughout the war years. With the end of the war, they were able to expand quickly to meet the civilian demands. The Northwest was already beginning to feel the effects of the world demand for its agricultural products. The other areas which were geared in great part to direct war activities were in no position to meet the changed post-war requirements quickly. The Southwest, with its heavy emphasis on war production and military establishments, lagged far behind, followed by the Far West, which was similarly situated.

Greatest interest, however, centers around the most recent history. From 1946 to 1947, the smallest increases in income payments to individuals occurred in the Far West indicating that the unusual rate of expansion in that area has slowed down considerably. New England continues to lag behind the rest of the country, as does the Southeast. By dramatic contrast the Northwest has shot far ahead of the rest of the country, and the rate of increase in the Southwest has also exceeded the national average substantially. This is accounted for in great part by the exceptional increase in farm income, which in turn results from the world-wide shortage of food products and accompanying high prices.

An analysis of income payments on a state-by-state basis would be even more revealing than the comparison by sections.

It is the function of many agencies in Washintgon to keep tabs on the various economic indicators. In general, all the indicators point to an increasing level of economic activity. The Department of Commerce reports that the national income in the second quarter of 1948 reached an annual rate of $221,000,000,000. This may be compared with the annual rate of $215,000,000,000 in the first quarter and $200,000,000,000 in the second quarter of last year. Over the year, the increase has been 11 per cent.

The same department also reports that corporate profits before taxes amounted to 8.4 billion dollars in the second quarter of 1948. This may be compared with 7.8 billions in the first quarter and 6.3 billions in the second quarter last year. Over the year, the increase has been 33 per cent. If profits were taken after taxes the increase of the year would be only 16 per cent. This increase in profits is reflected in a similar increase in dividends of 10 per cent in the three months ended August 31, 1948, over the same three months last year.

Representatives of the pit and quarry industries will probably be especially interested in a recent report of the Securities and Exchange Commission on plant and equipment expenditures, since a substantial proportion of their products find their markets in plant and equipment expansion.

The Commission finds that 9 billion dollars were spent for plant and equipment in the first half of this year, which is about the same amount as was spent in the last half of last year. The Commission also collects information from business

(*Continued on page* 84)

up from the ashes

by William M. Avery

another ON THE SPOT report

A TRULY outstanding job of reconstruction has been carried out at Columbia Quarry Company's No. 1 plant, located at Krause, Ill., which was virtually destroyed by fire in July, 1947. During a shutdown of approximately 10 months' duration the main building was reconstructed from the ground up and, with only minor exceptions, new facilities for crushing, screening and handling were installed throughout the plant.

As the largest unit in Columbia's four-plant network, loss of production at the No. 1 plant, located near Columbia, Ill., was a serious blow, wholly apart from the $550,000 fire loss incurred. Speed, therefore, inevitably became a major consideration in rebuilding the plant. Company executives, plant personnel and machinery manufacturers combined their efforts in an all-out drive that repeatedly produced near-miracles during the 10-month reconstruction period.

Despite the urgency of the work, however, full advantage was taken of this excellent opportunity to eliminate production bottlenecks. The crushing capacity of the old plant had been increased a number of times in recent years, but space limitations and other factors had prevented corresponding increases in screening capacity, with the result that the two were eventually rather seriously out of balance. In the new layout this condition was remedied by installing 5- by 14-ft. screens in place of the 4- by 8-ft. units used in the old plant, thus more than doubling the effective screen area.

• Left: A general view of Columbia Quarry Company's No. 1 plant at Krause, Ill. Production was resumed in June of this year, following a 10-month shut-down for reconstruction.

• Right: The main quarry has a 70-ft. face. One of the steam shovels is seen here loading a semi-trailer which will haul the stone about half a mile to the primary crusher. The gasoline-driven well drills are operating above.

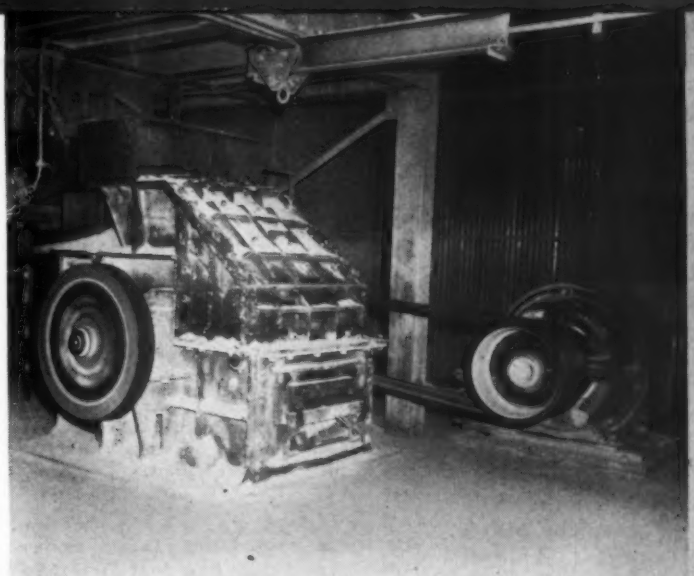
Only 10 months for Columbia to replace plant ravaged by fire

Although the general layout of the plant is essentially unchanged, increased screening capacity and other improvements carried out in conjunction with the rebuilding program will ultimately yield about 100 additional tons per hour of finished products. The plant is already easily producing at the rate of 350 t.p.h., and there is every indication that the average will reach 400 t.p.h. in the very near future. It is expected that daily output will average 6,000 tons in two 8-hr. shifts. About half of this output will go into agricultural limestone, with concrete stone, road stone and railroad ballast accounting for most of the remainder.

All spouts, gates and belt conveyors have been so arranged that any size of material produced can be fed to any one of the 10 finished product storage bins. Thus any desired blend is made up as the bins are loaded, and about 40 different grades of stone can be produced by blending various combinations of the 15 standard sizes separated by the screens.

As there have been a number of equipment additions in the quarry since the operations of this important plant were last described in PIT AND QUARRY, this account will undertake to cover the entire process in flow sheet order.

Stripping Overburden and cap rock, varying from 25 to 55 ft. in depth, are stripped and loaded with a Marion 111-M diesel



• One of the three hammermills in the pulverizing section. Each is producing agstone at the rate of 64 t.p.h. and 3/8-in. chips at the rate of 21 t.p.h. Feeding is handled by three 36- by 60-in. vibrating feeders. All three drives are 250-hp. 3-phase, 25-cycle, 440-volt motors.

• Of the 14 screens in the new plant, only three are units salvaged from the fire. Pictured here is one of the new screens which serve the agstone section of the plant.

shovel (3½-cu. yd. dipper) and a 50-B Bucyrus-Erie electric (2-cu. yd. dipper). In this phase of the operation five hauling units are employed —three Super C Tournatrailers of 12-cu. yd. capacity and two 6-cu. yd. Dodge end-dump trucks. The top ledge of dirt, averaging about 25 ft. in depth, is stripped directly, but the underlying cap rock, ranging up to 55 ft. in depth, requires drilling and blasting. Six-in. holes are drilled with No. 14 Sanderson-Cyclone churn drills. Due to inclusions of chert the cap rock is not regarded as suitable for concrete aggregate, but most of it is marketable as agstone and ballast stone. The marketable portion is hauled by the Tournatrailers to the west end of the quarry, where it is dumped over the face and recovered later for separate processing on the night shift. Cap rock is kept stripped back about 100 ft. from the face to prevent contamination of stone in the main quarry.

Drilling and Blasting The 70-ft. face of the main quarry is drilled with two 29-T Bucyrus Erie well drills and one No. 88 Loomis, all gasoline driven. These drill 8-in. holes for 7-in. dynamite. About 30 holes are shot at a time, using 14 cases of dynamite to a hole. A du Pont blasting timer is hooked up to two regular caps on the top of each hole for safety in case one cap should fail. Delayed action blasting with the timer has yielded some improvement over instantaneous firing in respect to breakage, and it has wholly eliminated vibration shock in the nearby city of Columbia, about two miles away.

Loading and Hauling Loading in the main quarry is done with a Marion 111-M diesel with a 3½-cu. yd. dipper and a 95-C Bucyrus steam shovel of the same capacity. Also on hand and maintained in good operating condition are two spare units—a 2½-cu. yd. Osgood and a 3½-cu. yd. Marion 92, both steam driven. The latter machine is used to a considerable extent for loading out cap rock from the west end of the quarry for night shift operations.

Six TR-13 Easton semi-trailers are used for hauling from the face to the crushing plant, at present a distance of about half a mile (one way). These units, drawn by International KS-11 gasoline-powered tractors, average a little over 17 tons per load. The trailers are side dumped directly into the primary crusher by means of a conventional Easton elbow-type dumping mechanism powered by an air hoist.

Crushing and Screening All four of the crushers in the old plant were salvaged and used in the new layout, along with a new 10-in. Superior-McCulley and a 636 Type R Allis-Chalmers to increase the proportion of minus 1-in. stone. All six of the crushers in the main plant are gyratory.

On the primary, a 21N Allis-Chalmers, the company has found that replacement of the eccentric at approximately 6-month intervals results in considerably higher production. Secondary crushers consist of two 10-in. Superior-McCulley fine-reduction units, one 16-in. Superior-McCulley, a 4-ft. Symons cone, and the Type R unit, which has an hydraulic setting to permit tramp iron to pass through.

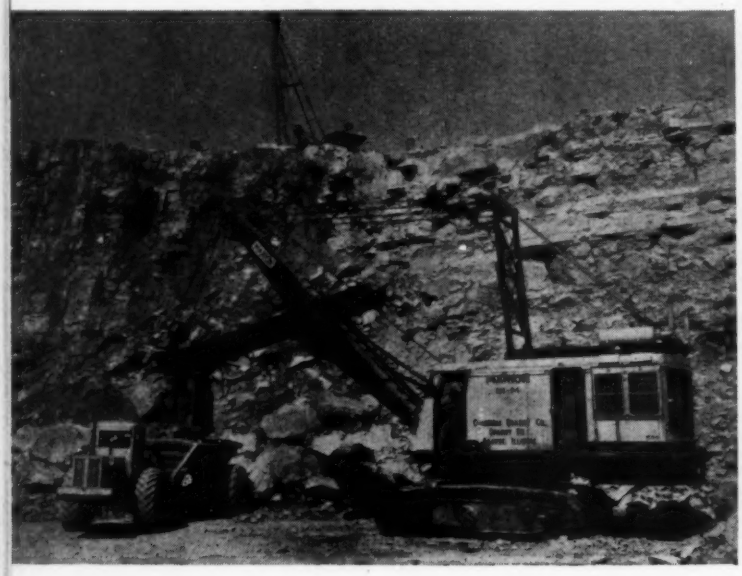
There is a possibility that in the near future the primary crusher will be relocated in the quarry. If this is done, the crushing plant will be fed by belt conveyor from a surge pile located between the primary and the main plant. Another development still in the planning stages is a separate rip rap plant. This will require the installation of a jaw crusher.

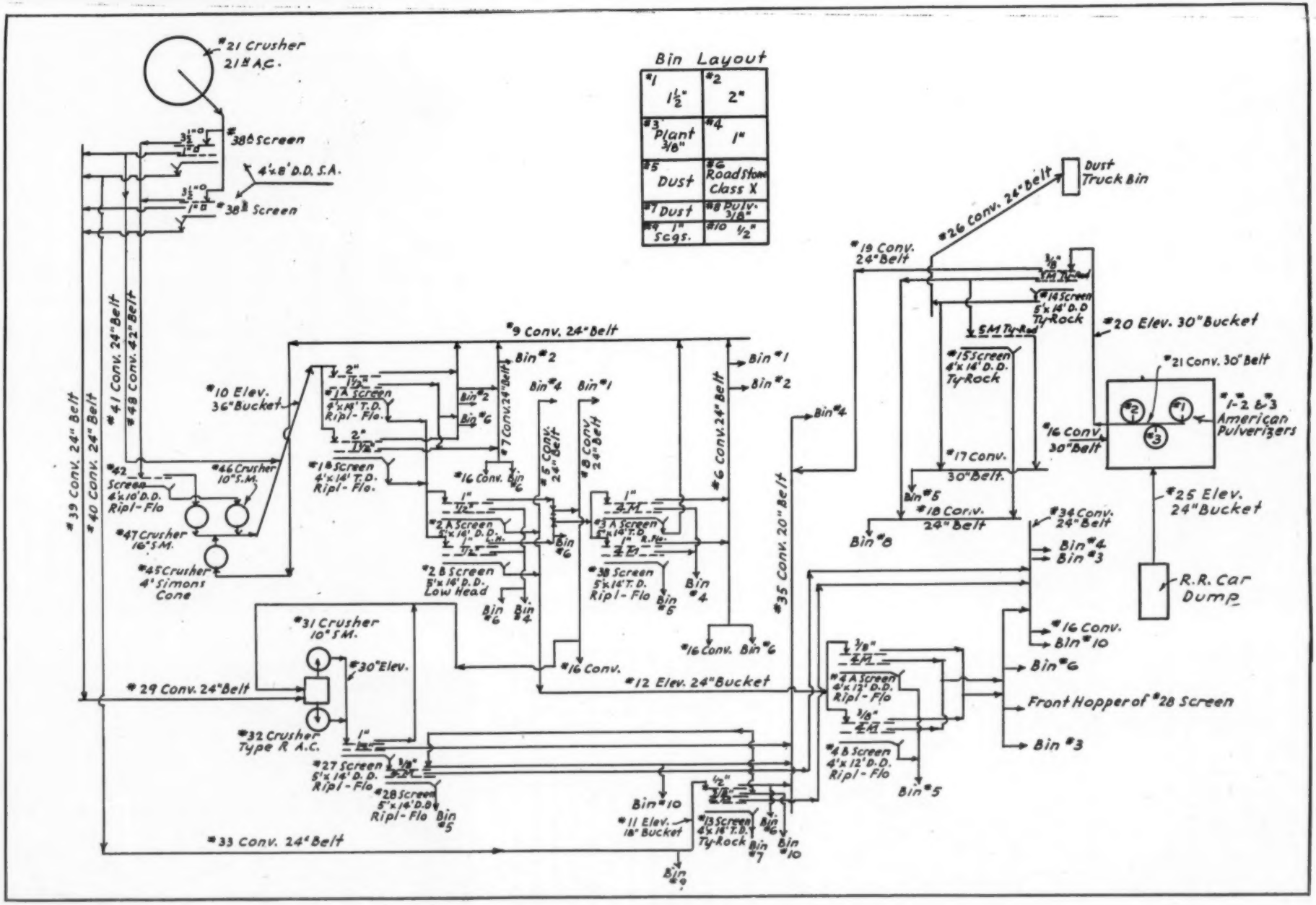
Of the 14 screens in the new plant, only three are units salvaged from the fire. The screening circuits now incorporate the following: two 4- by 8-ft. double-deck Stephens Adamsons (salvaged); one 4- by 10-ft. double-deck Allis-Chalmers Ripl-Flo, two 4- by 14-ft. triple-deck Ripl-Flos; two 5- by 14-ft. double-deck Allis-Chalmers Low-Heads; four 5- by 14-ft. Ripl-Flos; two 4- by 12-ft. Ripl-Flos; and one 4- by 14-ft. triple-deck Tyler Ty-Rock. In addition there are two Ty-Rock screens in the pulverizing section of the plant—a 5- by 14-ft. double-deck and a 4- by 14-ft. single-deck. To prevent blinding, all agstone screens throughout both the pulverizing section and the main plant are equipped with 9437 Ty-Rod screens. Except for 1-, 1½- and 2-in. screens, which consist of Allis-Chalmers perforated plate, all others were supplied by Ludlow-Saylor. The screen sections range from 2-in. down to 5 mesh.

Pulverizing The fire which destroyed Columbia's No. 1 plant originated in the control room of the pulverizing section. This structure, built in 1944 as an addition to the main building, was primarily of timber construction, and consequently none of the equipment was salvaged.

• Below, left: The 3½-cu. yd. diesel shovel loading cap rock from the upper quarry into one of the 12-cu. yd. trailers.

• Right: One of the six semi-trailers loading in the main quarry. These side-dump machines average a little over 17 tons per load. The tractors are gasoline-powered.





• Flowsheet of the new Columbia Quarry Company plant at Krause, Ill.

The new pulverizing plant, which differs considerably from the old in regard to layout, can be fed directly from the main plant by means of a 30-in. belt conveyor, or from storage piles by means of a track hopper; pan feeder and bucket elevator dischaging into a 300-ton surge bin. Stearns magnetic pulleys on the pan feeder and conveyors remove tramp iron before the stone reaches the pulverizers.

Three Syntro 36- by 60-in. vibrating feeders located directly under the bin feed the stone to three Type ACS-3 American hammermills. Full load on each of the pulverizers is maintained by means of rheostats with which the speed of feeders can be regulated. To prevent choking in the pulverizers, and to simplify later handling of the finished product, the feed stone is dried somewhat by means of coal fires which are kept burning constantly under each of the feeder pans.

In addition to agstone (85 percent passing 8-mesh), the pulverizers are being used to produce ⅜-in. chips for use in bituminous concrete. Each mill is producing agstone at the rate of 64 t.p.h. and chips at the rate of 21 t.p.h., or a total output for all three mills of 255 t.p.h. The main crushing plant also produces 14 to 16 percent of by-product agricultural limestone. Elevators, conveyors and screens in this section of the plant are electrically interlocked so that if any unit stops the entire circuit cuts off automatically.

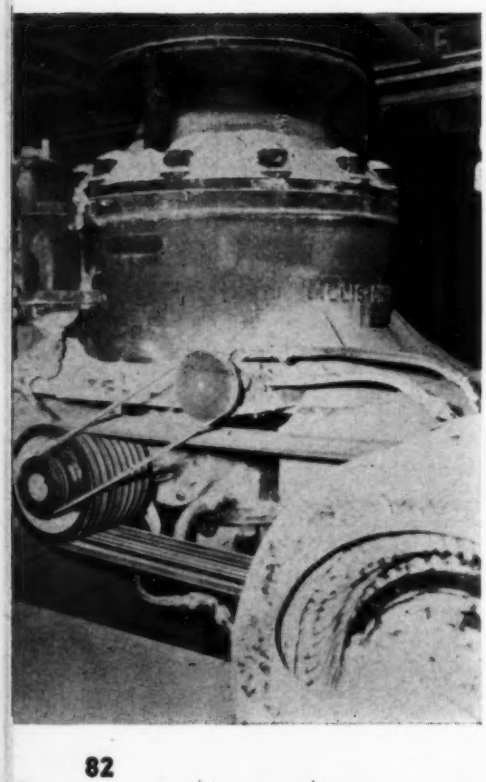
Finished material from the pulverizing plant can be fed onto a 30-in. belt conveyor which discharges into the plant agstone bin, or via a 24-in. belt into a 200 ton Blaw-Knox truck bin located outside the building. The plant is currently handling about 1,000 tons of truck loading per 8-hour shift.

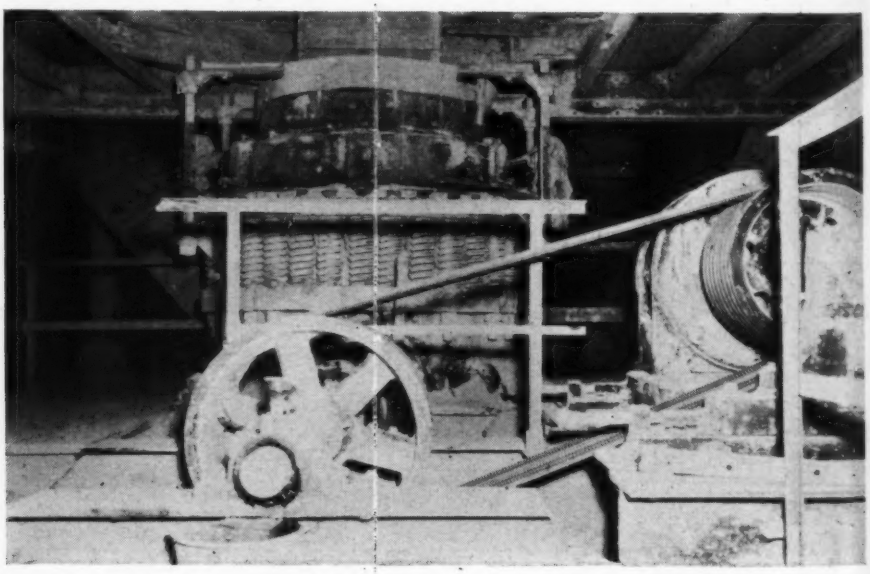
• E. A. Heise, superintendent of the Krause plant, has been with Columbia Quarry Co. for 26 years.

Storage and Shipping There are 10 storage bins under the main plant structure — six of 100 tons' capacity and four of 50 tons' capacity. These are used primarily for loading out rail shipments, but the double track which the bins straddle is fully decked so that trucks may be used. Normally, however, truck loading of stone is handled from four Type S-100, 125-ton Butler bins located on a rail siding close to the plant. Cranes are used to feed these bins from open storage piles.

Rail shipments are weighed on two Howe track scales which extend the full length of the bins. This arrangement assures both accurate and complete loading of the cars. There are 15 miles of track within the Krause plant for handling and storing empty and loaded cars. As empty cars come into the plant they are shoved into 6 tracks in the upper yards, where they are cleaned and patched in preparation for loading. Cars are handled within the plant by two locomotives—a 40-ton American saddle tank and a 75-ton Lima. They bring the cars down from the upper yards, spot them under the bins for loading, and finally shove them into seven storage tracks in the lower yards. From 80 to 100 cars are handled in the plant each working day. The property is served by the Illinois Central, the Missouri Pacific and the Gulf Mobile & Ohio railroads.

For loading stone into and out of storage piles there are two 25-ton Ohio gasoline-powered locomotive cranes. These have 50-ft. booms and are equipped with 1½-cu. yd. clamshell buckets. One of the cranes is used for loading the cars, which feed the underground track hopper at the pulverizing plant. Three bulldozers (an International TD-18, a TD-35 and a D-7 Caterpillar) are available for shoving stone in from the storage piles to the adjacent tracks, so it can be reached with the cranes. These units are also used for quarry





• One of the six gyratory crushers in the main plant is the 4-ft. cone which was salvaged from the fire.

• Left: This Type R crusher was installed in the new layout to increase the proportion of minus 1-in. stone. It has a hydraulic setting to permit tramp iron to pass through.

road maintenance and spillage cleanup at the working face.

As part of its overall storage problem the company gave careful consideration to the matter of coal storage, with the result that an entirely new handing system has been installed. The main storage (about 1,000 tons) is on a 32- by 128-ft. reinforced concrete slab located on high ground. Coal is loaded into storage by running delivery trucks right into the paved area. For reloading into company trucks there is a 50-ton truck bin which can be fed from the storage area with one of the cranes. Normally about 500 tons of coal will be kept on hand.

Electrical All but one of the motors in the old plant were damaged beyond repair in the fire. In most instances the castings were smashed as the various floors in the building dropped. In the rebuilt layout there is approximately 400 hp. in the crushing and screening plant, consisting largely of small motors from 3 to 25 hp., and about 900 hp. in the pulverizing section, including three 250-hp. drives on the hammermills. All are 3-phase, 25-cycle, 440-volt units supplied by Allis-Chalmers. All small motors are controlled by magnetic starters, with interlock systems to prevent chokeups.

There are five load centers in the plant, including a three-section installation with four panels on the screening floor. Control panel equipment was furnished by Trumbull Electrical Co., with Columbia's own personnel handling the engineering and shop work. Bus duct was used for the distribution system in the pulverizing plant.

Power Since 1936[1] the Krause plant has generated all of its own power, the initial installation consisting of two Superior 12½- by 15-in. 4-cycle diesel engines rated at 525 and 400 hp. Housed in a separate building several hundred feet away from the crushing and screening plant, the power station suffered no fire damage. A new engine, purchased just before the fire for standby purposes, has now been installed, bringing the total capacity to 1,916 kw., or about 2,675 hp.

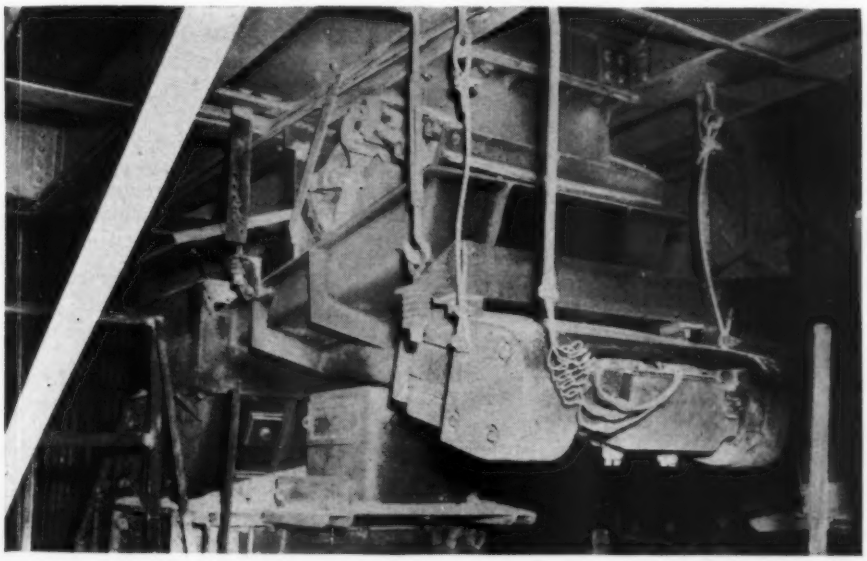
The new engine, a 750-hp. Type VDSS 6-cylinder Superior diesel, replaces a 500-hp. unit which was sent to another plant. Thus there are still four main engines in the Krause power plant,[2] including two initially installed in 1944 and the latest addition. The two large engines are supercharged with an Elliott turbo charger. All the engines are started by compressed air supplied from individual receivers at 250 lbs. pressure. Each has its own Viking fuel pump connected directly to a 15,000-gal. outside storage tank. The plant is said to produce power at an average rate of about 11.5 kw.-hrs. per gallon of "Standard" High Speed fuel oil.

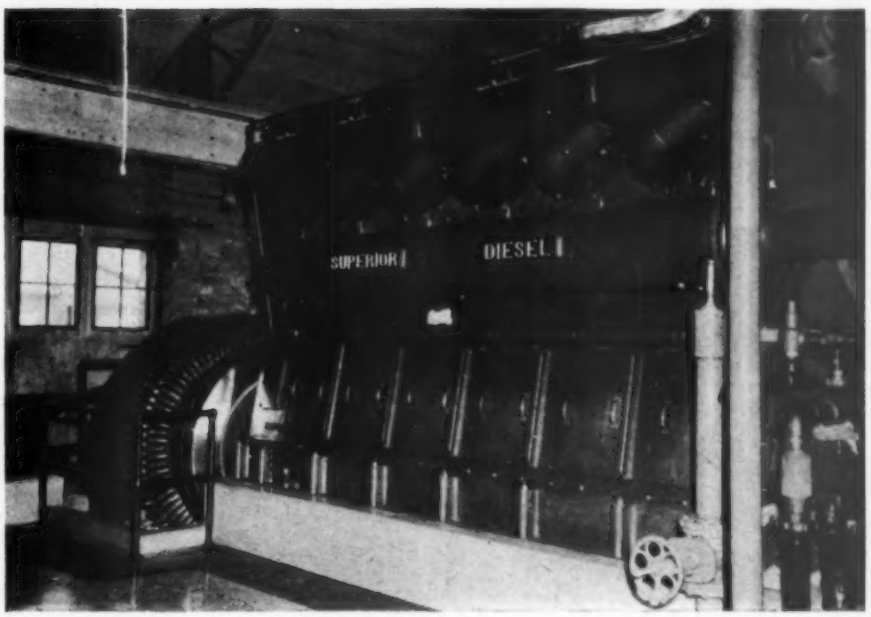
Other recent installations in the power station are a cooling tower for the new engine and a 3,000-amp. Westinghouse air breaker. The total load handled is somewhat greater than before the fire, largely due to use of 250-hp. motors on the 3 agstone mills in place of 200-hp. units in the former setup. J. T. McDiermon has charge of the power plant.

Auxiliary Facilities Extensive operations on the scale maintained at Columbia's No. 1 plant requires many auxiliary facilities not often found in crushed stone plants. The repair shop building, a 60- by 100-ft. concrete block structure, is one of the best equipped shops of its kind that we have seen. A 5-ton traveling crane operates on an overhead runway extending the full length of the building, and there are standard-gauge tracks down the center, so that locomotive repairs can be handled. Just outside the building there is a concrete repair pit for working on undercarriages. Pri-

[1]See Trauffer, Walter E.—*Installs Diesel-Driven Generators for Dependable and Low-Cost Power*, PIT AND QUARRY, March, 1937, p. 84.

[2]See Avery, William M.—*Power Demands Met by Adding Fourth Diesel*, PIT AND QUARRY, December, 1944, page 74.





• A close-up of one of the 36- by 60-in. vibrating feeders which feed the pulverizers. The feed stone is dried somewhat by means of coal fires under each of the feeder pans.

• Right: Newest of four diesel engines in the power plant is this 750-hp., 6-cylinder supercharged unit.

mary shop equipment includes two lathes, two drill presses, a shaper, a key seater, two power hack saws, three emery grinders, modern welding equipment, and a Bucyrus-Erie No. 12 bit dresser for 6- and 8-in. bits.

The 40- by 70-ft. concrete block garage building has double overhead doors at each end to accommodate the big Easton semi-trailers. There are two inside repair pits, each served by an overhead crane.

The company keeps about $10,000 worth of repair parts and supplies on hand at all times in order to prevent costly production delays. These supplies are stored neatly in bins and carefully labeled to assure correct identification. Detailed cost records, covering both labor and materials, are kept on all repair and installation jobs. Thus the management is able to determine quickly if costs on any particular unit of equipment are excessive.

Credits All the conveyors and elevating equipment throughout the new plant were supplied by Stephens-Adamson, to whom, along with Allis-Chalmers, W. S. Tyler, American Pulverizer, Westinghouse, General Electric, Trumbull, Ludlow-Saylor and other manufacturers, the management of Columbia acknowledges indebtedness for outstanding services rendered in making it possible to resume production so quickly. Even in normal times the completion in 10 months of a major construction program involving expenditures of $750,000 would stand as a noteworthy accomplishment.

The reconstruction program at Krause was under the diect supervision of Columbia's capable plant superintendent E. A. Heise. Electrical design and supervision was supervised by Ted Umbright, chief electrician. The company's top officials are H. C. Krause, president; William E. Schmidt, vice president and treasurer; C. H. Krause II, vice president and purchasing agent, and A. J. Elliott, secretary and assistant treasurer.

In addition to the Krause plant, Columbia maintains operations at Prairie du Rocher and Valmeyer, Ill., and at Elsberry, Mo. There are 185 men on the payroll at Krause.

Washington News Letter

(*From page* 73)

men on their anticipated expenditures for plant and equipment. It came up with a very important figure. In the second half of 1948 the Commission estimates that plant and equipment expenditures will increase to 9.6 billion dollars. For the entire year 1948, therefore, these expenditures would amount to 18.6 billions, which may be compared with the expenditures last year of 16.2 billions, showing an increase of 15 per cent.

Safe Quarry Truck Operation Outlined in New Data Sheet

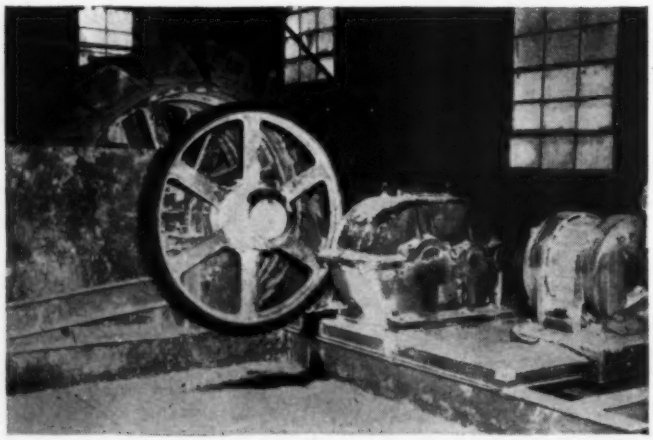
A growing accident problem has resulted from the increased use of trucks by quarries, construction companies and mines. To help meet this problem successfully, the National Safety Council has prepared a new industrial data sheet on the safe use of trucks in these industries.

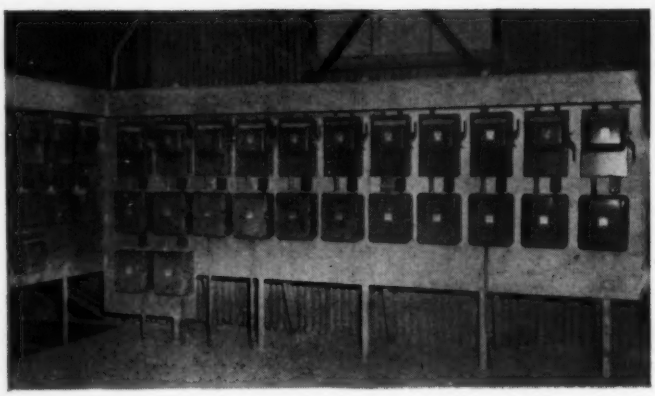
Particular phases of truck operations creating the major accident problems are covered and safe procedures which will reduce the hazards are outlined. A continuing safety educational program is urged as one of the best ways to make employees aware of the hazards and how to avoid them.

Drivers, repairmen and workers should be told about the dangers in unexpected movements of trucks, in the loading and unloading of materials and supplies, and in getting on and off vehicles. They should be trained in safe practices and checked periodically until prescribed practices are followed.

The data sheet was prepared by G. G. Grieve, safety engineer of the Council's industrial department. Inquiries should be addressed to the National Safety Council, 20 N. Wacker Dr., Chicago 6, Ill.

Ending a 32-day strike, 220 workers at the Medusa Portland Cement Company's plant in Wampum, Pa., returned to work on September 28. A company spokesman said the employees, members of the AFL United Cement, Lime & Gypsum Workers Union, received an 11½-cent hourly wage increase.

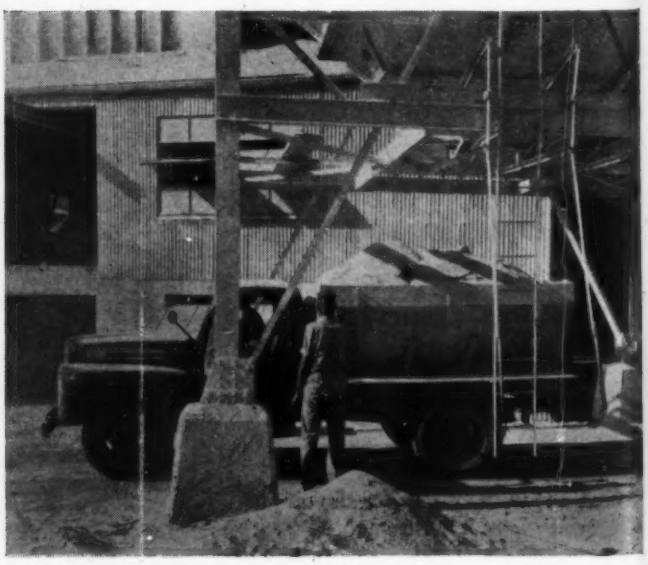




• **Left: Head shaft and drive on one of the principal bucket elevators in the plant.**

• **Below, left: Among the five loading centers in the plant is this 4-panel installation located on the screening floor.**

• **Below, right: Loading agstone in a spreader body from the 200-ton bruck bin.**



Present Hudson Operation A Monument to Initiative And Skill of Tom Hudson

another ON THE SPOT report

OUTWARDLY the plant of Hudson Stone Products near Lynchburg, Ohio, is not particularly prepossessing, but behind it lies a very interesting story of native American initiative and success. This crushed stone and agricultural limestone plant became the property of Tom N. Hudson in the Spring of 1942, and he gradually replaced the old and obsolete equipment and built it into a profitable, modern 80-ton-per-hour operation.

By WALTER E. TRAUFFER

Tom Hudson had been in the sand and gravel business at Boone, Iowa, for some years but finally decided to make a change. Early in 1942 he sold his gravel plant and started out for Michigan to buy the equipment for a concrete block plant he planned to build in Aurora, Ill. The first night out he stayed over in Clinton, Iowa. In the hotel he looked over the current copy of PIT AND QUARRY which he had received that day. In it he saw an advertisement offering for sale the property which he now owns. The next day he headed for Ohio instead of Michigan and quickly closed a satisfactory deal for the plant.

The plant at that time was only about two-thirds completed and much of the equipment was second-hand. Mr. Hudson retained the gyratory primary crusher and the rolls, but replaced the steam power plant with electric motors. Other new and used equipment was purchased and installed to put the plant into operation. Full attention was then devoted to production, and the business prospered during the war years. As soon as the war was over, Mr. Hudson put in orders for equipment to really modernize this plant. By March 15, 1947, the equipment had been assembled and the plant was shut down. A new crusher was installed, the screen was relocated, and a new bucket, two belt conveyors, a 3-phase generating plant and other equipment were added. This work was done in record time and on April 1 the plant was again in operation.

• F. E. Shaffer, office manager; H. E. Burns, superintendent; and Tom N. Hudson.

• The 1-cu. yd. shovel in the quarry of Hudson Stone Products near Lynchburg, O., loading to a truck.

• A general view of the Hudson plant, showing the truck ramp at the right.

The property is located 2½ mi. east of Lynchburg and is in the heart of a potentially rich farming section. This is flat, no-drain, hard-pan country but very fertile. Much of it is lying idle and requires only drainage and liming, according to Mr. Hudson. The deposit is a 20- to 22-ft. ledge of laminated crystalline limestone fairly high in magnesium, with 7 to 8 ft. of overburden. The latter is removed in slack seasons by the quarry shovel and trucks.

Drilling is done with a 5-in. Star churn drill which will soon be replaced by a larger machine. A wagon drill was originally used but the churn drill proved to be more satisfactory. The yield now is about

4 tons per lb. of the Independent Explosive Co. 600 Rock Quarry Powder used. This is the more remarkable as Mr. Hudson firmly believes that the cheapest way to break rock is to blast it in the quarry; and the hole loadings are unusually heavy. This practice results in very few pieces too large for the crusher and those are pushed to one side, as no secondary shooting is done. Even better results are expected when Atlas Rockmaster caps are adopted in the near future. The drill holes have an 11-ft. burden and are spaced 12 ft. apart. In dry weather two rows of six holes each are detonated at once. In wet weather single-row shots are made.

The stone is loaded into the quarry trucks by a Thew Lorain 55 shovel with a 1-cu. yd. dipper and a Waukesha gasoline engine. Three trucks and two drivers are used, one truck being loaded while the other two are in transit. The fleet consists of a Mack 2½-ton, an International 1½-ton, and a Dodge 2-ton. The haul is up grade to the plant.

The trucks discharge the stone on the 30-in. by 8-ft. New Holland pan feeder which is driven by a variable-speed motor to insure a steady feed to the crusher. This has increased the crusher output more than 25 percent over the original start-stop method. It has also resulted in a power saving which is important because of the limited amount available. The New Holland 30-30 double-impeller crusher replaced two other crushers and is doing an excellent job, reducing the quarry run stone to ¾-in. minus at the rate of 80 t.p.h. Of the product about 40 percent is agstone running from 28 to 45 percent through 100-mesh (20 percent is specified). The crusher is driven through a flat belt by a Caterpillar D 11000 engine which has a wide speed range. According to Mr. Hudson it is almost impossible to plug this crusher even at idling speed.

The product of the crusher is discharged on a short belt conveyor from which a bucket elevator feeds it on a 4- by 8-ft. Deister Machine Co. 3-deck screen. These decks are equipped, from top to bottom, with ¾-in., ½- or ⅜-in., and 3/16-in. Tyler wire cloth, the bottom two decks using Ty-Rod. The use of an extra deck, according to Mr. Hudson, insures the maximum yield of agstone from the crusher product. There is a tapered welded chute for each deck and these have individual sliding proportioning plates or dividers which make it possible to divert any single size or any combination into any of the four compartments of the 50-ton bin. The material through the bottom deck is agstone which can be discharged into either of two of the compartments.

Any size or fraction of a size not desired can be discharged through a chute to a hopper and thence on a 24-in. by 40-ft. Cedarapids belt conveyor back onto the crusher feeder. With this system of re-circulation, the output can be adjusted to the demand, thus reducing the unnecessary stockpiling of unwanted sizes. Mr. Hudson is contemplating

(*Continued on page* 88.)

• All sizing is done by this 4- by 8-ft. four-deck screen.

• Above: The special arrangement of chutes on the four-deck screen which makes any desired blend possible.

• Left: A closeup of the double-impeller crusher which reduces quarry run stone to ¾-in. minus. Supt. H. E. Bevens is standing alongside.

• Right: The double-impeller crusher with conveyor and elevator to the sizing screen. The conveyor (right) can return any size from the screen for further reduction.

Report on Current Labor Developments

THE OVERTIME-ON-OVERTIME STORY

By S. HERBERT UNTERBERGER

NONE of the labor developments in recent months is equal in importance and complexity to the Supreme Court decision in the so-called overtime-on-overtime case—otherwise named the Bay Ridge case (after one of the companies involved), or the Longshoremen's case (after the occupation of the affected workers). The special circumstances of the New York longshore industry gave rise to this case, but the Court's decision affects every employer who is covered by the Fair Labor Standards Act (more frequently referred to as the Wage and Hour law)—every employer who is engaged in interstate commerce, including most of the operators in the pit and quarry industries.

In its decision, the Supreme Court said, in effect, that many of the methods for calculating the required overtime payments which have been in use were never permitted by the law. Frequently, these methods had been approved or prescribed by the Wage and Hour administrator in his official interpretations. Employers will have to conform with the Bay Ridge rule or run the risk of violating the law and of suffering its maximum penalty—paying an employee not only the unpaid overtime due him but *double* that amount.

At this writing, the Wage and Hour administrator's latest statement is that he will not begin enforcing the new rule until the Supreme Court acts on a pending petition for a rehearing of the Bay Ridge case. The Court is expected to act shortly. Most authorities in Washington agree that it will probably deny the petition and the original ruling will stand. Even though the government has given this assurance that it will not institute court actions against employers who are not conforming with the new rule, an employer may, nevertheless, be sued by employees for overtime compensation due them under it.

What is the Bay Ridge Rule? In essence, the Supreme Court said a very simple thing—with complicated consequences. It should be remembered that the Fair Labor Standards Act requires that for hours in excess of 40 per week, employees must be paid at not less than one and one-half times their regular rate of pay. The Supreme Court merely said that an employee's regular rate of pay includes all compensation for work done except, and *only* except, the premium payments made to him because he has already worked a specified number of hours in the work-week or work-day. This means that premium pay for working at undesirable times, such as on Saturdays, Sundays, holidays, or at night, must be included in the employee's regular rate, when calculating the overtime premium required. Formerly, premium pay on Saturday and Sunday did not have to be included.

When are employers affected by the new rule? (1) The employer must be subject to the Fair Labor Standards Act. While many companies in the pit and quarry industries are undoubtedly covered by the law, there may also be a sizable number about which there is real doubt. Leading trade associations in these industries have maintained consistently that many of their members, particularly in the extractive branches, are not covered by the law because they are not engaged in interstate commerce.

(2) The employer must work his employees more than 40 hours in a week.

(3) The employer must, either by contract or practice, pay a premium rate for work on some special days, such as holidays, Saturdays or Sundays, or on some special hours, such as after 5 p.m., whether or not his employees have worked a specified number of hours in the previous work-week or work-day.

How the employer is affected—(1) If he pays a premium for Saturday or Sunday, it must be included in the regular rate of pay unless—and this is very important—a premium would have been paid for the same hours because his employees had already worked a specified number of hours in the work-week. In the latter case, the premium would be paid for both reasons and would therefore not be included in the regular rate.

(2) If he pays a premium for late hours, it must be included in

For some months an outstanding feature of each issue of Pit and Quarry has been the Washington News Letter page, written by S. Herbert Unterberger, well-known economist and authority on industrial and labor relations. Beginning with this issue Mr. Unterberger will provide a second monthly page entitled "Report on Current Labor Developments." More information on this new department and the reasons for starting it is contained in an editorial in this issue.

Mr. Unterberger is director of research of the Labor Relations Bureau, an organization which plans and conducts surveys of wages and labor relations practices, provides reports on current labor developments, analyzes contract provisions, and performs other technical services for private clients.

Previously he conducted a number of studies for the Office of War Mobilization and Reconversion on the experience of leading companies with various kinds of employment security plans. He also directed the Case Analysis Division of the National War Labor Board, acting as technical consultant to the board and supervising the preparation of reports analyzing the wage and labor relations issues involved in the cases which came before it. He has served as labor economist with the U. S. Railroad Retirement Board, as senior statistician with the Pennsylvania Department of Labor and Industry, and as economist and statistician with various government agencies studying problems related to employment and labor productivity.

Mr. Unterberger was author (with Max Malin) of "Operating Under the Taft-Hartley Act" and is a contributor to professional and business journals (e.g. American Economic Review, Business Week, etc.). His college degrees are B.S. at Wharton School of Finance and Commerce, University of Pennsylvania and M.A. at Graduate School, University of Pennsylvania.

the regular rate of pay, again unless a premium would have been paid for the same hours because his employees had already worked a specified number of hours in that work day.

(3) If he pays a premium for holidays worked, it must be included in the regular rate of pay. If he would have paid straight time for the holiday even if the employee had not worked, that amount may be deducted before calculating the regular rate of pay, unless doing so would reduce the regular rate.

Points to Employers—The principal difficulty arising out of the Bay Ridge rule is not so much that it adds to the cost of overtime but more that it complicates payroll accounting. It will be extremely important henceforth to identify premium payments carefully so that there will be a clear differentiation between those which must be included and those which may be excluded from the regular rate of pay.

To minimize their difficulties under the new rule, employers are frequently advised to begin their work-weeks on Monday morning so that Saturday and Sunday work will occur generally at the time when premium payments must be made in any event because of previous work performed in the work-week. As mentioned above, the premium payment then does not have to be included in the regular rate of pay.

With enforcement of the rule imminent, it is important for every employer to review his premium pay practices to determine whether they need revision or clearer definition. Changes will frequently require negotiation and agreement with labor unions. Failure to conform to the new rule can, of course, become very costly.

RE-EMPLOYING THE NEW DRAFTEES

All the problems associated with re-employing the veterans of World War II are far from solved, and the manpower problems arising out of the first peace-time draft have not quite begun. Nevertheless, it is not too soon to recognize that under the new draft law an employer's responsibility to his employees who enter the armed services is somewhat greater than it was under the old law.

The new law's requirements with respect to veterans with service-connected disabilities is more stringent than the old. If the veteran cannot perform the duties of his former position, he must be reinstated to any other available position of like seniority, status and pay which he is qualified to perform.

The new law goes farther than the old one with respect to restoration without loss of seniority or other benefits, by requiring that the veteran be ". . . restored in such manner as to give him such status in his employment as he would have enjoyed if he had continued in such employment continuously from the time of his entering the armed forces." Although the full meaning of this provision is not yet clarified, it might require giving the returning veteran all the pay advances and promotions he would have received had he stayed on the job.

Furthermore, the new law tries to take care of the knotty problem when two veterans return to claim the same job. In general, the first to go has prior claim to the job. However, if the second has greater seniority, the new law appears to require that he should get the job. The employee who fails to get his original job back is still entitled to one of like seniority, status and pay if such exists.

The new law also takes care of the problem of the responsibility of successor employers by specifically requiring them to rehire their predecessor's employees.

PENSIONS MUST BE BARGAINED

A recent Circuit Court decision requires the Inland Steel Company to bargain with the union about their pension plan. Although the case is sure to be appealed to the Supreme Court. It appears likely that the ruling will be upheld.

The ruling is significant from several points of view. First, it should be noted that the Court clearly said that not only the details of the pension plan but also the age of retirement is a proper subject of collective bargaining. Employers will no longer be the sole judge of when an employee has reached the time when he should be retired.

Of even greater importance in the long run is the fact that this decision advances the now unmistakable trend toward making every aspect of the employer-employee relationship a valid subject of collective bargaining.

Present Hudson Operation

(*From page* 86)

the installation of storage silos for this material so that the recrushing can be done at night.

A Buda 30-kw. diesel-generator set provides the current for the five electric motors (totaling 32½ hp.) which operates the feeder, the two belt conveyors, the elevator and the screen.

The plant is operated the year around and in winter the products are stockpiled off the bank into a worked-out section of the quarry. Reloading into trucks for shipment is done by a ⅝-cu. yd. Austin shovel. A Cletrac Model F gasoline tractor with a Woods bulldozer is used for general utility in the quarry and about the plant.

Mr. Hudson has no agstone contract but sells direct to a limited number of truckers who buy the stone on the basis of a 5 percent discount for payment within a week. The truckers do the spreading. Some farmers also send their own trucks for agstone on the same basis. This system has obvious advantages.

A. O. Smith oxy-acetylene and electric welders are used to maintain the equipment, etc. The main function of the electric welder is to rebuild the crusher impeller bars which wear comparatively rapidly on this hard and abrasive stone. Each 400-lb. bar loses about 6 lb. of metal daily. This is replaced at frequent intervals with American Agile Corp. dry flux dark-green welding rod. Shovel dipper-teeth and other items are similarly rebuilt.

State College of Washington Conducting Pumice Research

A research project is currently being conducted on the pumice resources of the state of Washington. Heading the study is Dr. William A. Pearl of the State College of Washington, Division of Industrial Research. In the Wenatchee area the work is under the supervision of J. J. Wegner, chemical engineer.

Washington State College last spring offered the facilities of its Industrial Research Division to assist in setting standards and specifications for the pumice industry. Tests for compressive strength, water absorption, moisture content and thermal conductivity are being run.

Fire Follows Explosion at Bituminous Products Plant

An explosion, and a resultant flash fire among ten 10,000-gallon asphalt and oil storage tanks at the Bituminous Products Inc. plant at Buffalo, N. Y., recently caused extensive damage.

According to President Charles E. Buchman, a preliminary survey showed that the chief damage occurred in the piping, valves and wiring of the storage tanks and to the adjoining boiler room. No estimate of total damage was given.

Reconditioning of the plant got underway immediately in an effort to restore production.

Relations Between Cement Formulae And Phase Diagrams

By KENICHI HASHIMOTO
Government Chemical Industrial Research Laboratory, Tokyo

IT is usually said that the quality of portland cement depends on high lime content, but when cement is overlimed there will be free lime, even when the cement is well burned, and this will cause expansion cracks involving in extreme cases the risk of destruction of any structure in which the cement is used. The cement formulae give the maximum proportion of lime which can be made to combine with the acidic oxides during the burning. Various formulae have been proposed, but they can all be given the general form of

$$CaO=\sigma SiO_2+\alpha Al_2O_3+\phi Fe_2O_3+\mu MgO+\gamma SO_3$$

the coefficients σ, α, ϕ, μ and γ are shown in Table 1.

Formulae Derived from Stoichiometrical Relations

In formulae (1)-(9) all coefficients are derived from the following relations:

For silicates—C_mS_n[1]

$$\sigma=\frac{m}{n}\cdot\frac{CaO}{SiO_2}=\frac{56}{60}\cdot\frac{m}{n}=0.93\,\frac{m}{n}$$

For aluminates—C_mA_n

$$\alpha=\frac{m}{n}\cdot\frac{CaO}{Al_2O_3}=\frac{56}{102}\cdot\frac{m}{n}=0.55\,\frac{m}{n}$$

For ferrites—C_mF_n

$$\phi=\frac{m}{n}\cdot\frac{CaO}{Fe_2O_3}=\frac{56}{160}\cdot\frac{m}{n}=0.34\,\frac{m}{n}$$

For magnesia

$$\mu=\frac{CaO}{MgO}=\frac{56}{40}=1.4$$

For sulphate radical

$$\gamma=\frac{CaO}{SO_3}=\frac{56}{80}=0.7$$

[1]C=CaO, S=SiO_2, A=Al_2O_3, F=Fe_2O_3, M=MgO—Ed.

In formula (10) where the Brownmillerite (C_4AF) is considered for the first time, the aluminoferrite is divided into binary compounds

$$C_4AF=C_3A+CF$$

and the coefficients α and ϕ are derived for each aluminate and ferrite. Inversely therefore it can be said that in formulae (8) and (9) the Brownmillerite is already assumed.

As the formulae are not all proposed as cement formulae, but some are for other purposes, explanations are needed.

(1) Le Chatelier; Annales des mines, 1887. p. 345. This formula is nearly correct, but μ, which is derived from the molecular ratio CaO:MgO and attached with a minus sign, is not sufficiently justified.

(2) S. B. and W. B. Newberry; The constitution of hydraulic cements. J. Soc. Chem. Ind. 16 (1897) 887-94. On preparation of pure C_3A and observation of its hydration, S. B. and W. B. Newberry acknowledged its expansion cracking. They stated that high alumina means the same as the presence of free lime in portland cement. For this reason they rejected the C_3A of Le Chatelier's formula and adopted a hypothetical compound, C_2A.

Wetzel[2] studied the microscopical structure of clinkers having the chemical composition C_3S+S_2A and found that they are composed of only one crystalline phase in the ground mass. In Rankin's diagram of the ternary system CaO-Al_2O_3-SiO_2, it is clear that the line C_3S-C_2A, which is called after Wetzel, traverses the field of C_3S lengthwise. It can be said that Wetzel was the first who discovered the existence of C_3S in the ternary system, though it was only on a single straight line. In Germany, Wetzel's line was considered as the "theoretische Treibengrenze"[3] which must not be overstepped in proportioning the raw mixture. As the line C_3A-C_3S lies entirely on the field of lime, Le Chatelier's formula is too severe, and in this view the Newberry's formula is more rational, even if it is based on a hypothetical compound.

(3) Kuhl; Das Eisen im Portlandzement. Tonind.-Ztg. 38 (1914) 537-40. Kuhl assumed the compound C_3F_2 which was introduced by Hilpert and Kohlmeyer. (Ber. *42* (1909) 4581-94.) It is interesting that $C_3A+C_3F_2$ gives C_6AF_2, which was later ackowledged by Janecke (Protokoll 1928), Nagai-Sawayama (1934) and recently by Swayze (1946).

(4) Hendrickx; Les ciments haute resistance. Chim. et ind. 8 (1922) 296-304. This formula assumes a peculiar compound, $C_{2.5}S$, which is not acknowledged by any other authors.

(5) Merriman; Lime-silica index as measure of cement quality. Rock Prod. 29 (1926) May 26, p. 51. This formula is derived from the above index, which gives the maximum value of 2.8 when all lime silicate is C_3S.

(6) Nagai; J. Jap. Ceram. Assn. 37 (1929) 180. This formula is derived from the lime-silica molecular ratio, using the highest value of 3.

(7) Janecke; Uber die "beste" Zusammensetzung des Portlandzementklinkers. Zement 18 (1929) 288-92. Janecke has shown that the best composition of portland cement is represented by the following equation:

$$\frac{SiO_2}{35}+\frac{Al_2O_3}{31}+\frac{Fe_2O_3}{59}=0.95$$

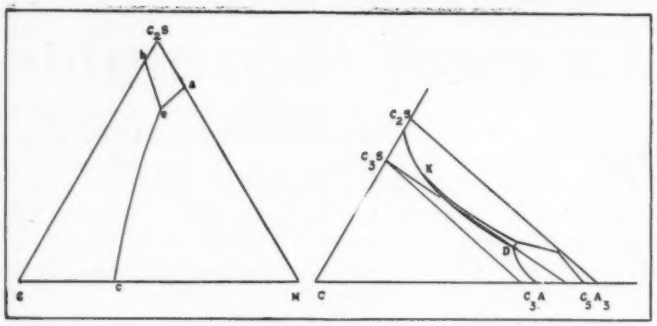
The figure of 0.95 is intended to show the existence of 5% free lime. Kuhl has cast the equation into the form

[2]More complete references to some of the papers mentioned are given below:
Wetzel, Ver. Deut. Portland Cement Fab., 1913.
Hess, Zement *20*, 28-32 (1931).
Spindel, Zement *20*, 338-40 (1931).
Lea and Parker, (Brit.) Building Research Technical Paper No. 16, 1935.
Lea, Stockholm symposium, (1938) Proceedings, p. 127.
Swayze, Am. J. Sci., *244*, 1-30, 65-94 (1946).
Brownmiller and Bogue, Am. J. Sci., *23*, 501-24 (1932).
Brownmiller (and Work), Am. J. Sci., *29*, 260-277 (1935).—Ed.

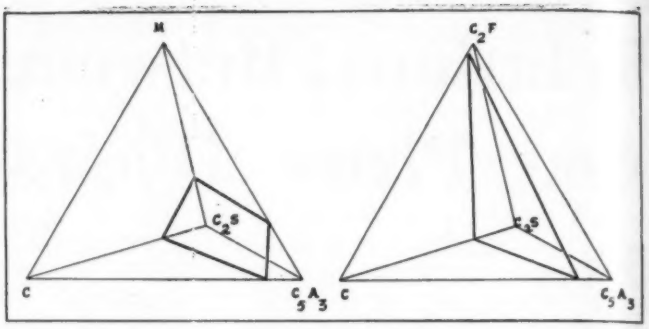
[3]*i. e.* theoretical soundness limit.—Ed.

Table 1.—List of Cement Formulae

	$\frac{m}{n}$ C_mS_n σ	$\frac{m}{n}$ C_mA_n θ	C-A-F	$\frac{m}{n}$ C_mF_n Φ	MgO μ	$CaSO_4$ γ	Free CaO
1) Le Chatelier (1887)	3 2.8	3 1.65	.....	.....	—1.4	.....	.....
2) Newberry (1897)	3 2.8	2 1.1	.....	.....	.....	.....	.....
3) Kuhl (1914)	3 2.8	3 1.65	.....	3/2 0.54	.....	.....	.....
4) Hendrickx (1922)	2.5 2.33	3 1.65	(611)	3 1.05	.....	.....	.....
5) Merriman (1926)	3 2.8	3 1.64	(611)	3 1.05	.....	.....	.....
6) Nagai I (1929)	3 2.8	3 1.65	(511)	2 0.7	.....	0.7	.....
7) Janecke (1929)	2 1.86	4 2.2	(611)	2 0.7	.....	.....	+5%
8) Guttmann und Gille I	3 2.8	3 1.65	(411)	1 0.35	.....	0.7	.....
9) G & G II = Kuhl (1929)	3 2.8	2 1.1	(411)	2 0.7	....	0.7	.....
10) Bogue = Nagai II	3 2.8	3 1.65	C_4AF	1 0.35	.....	0.7	.....
11) Lea and Parker (1935)	3 2.8		1.18	C_4AF	0.65	.....	.....



• Figure 1



• Left: Figure 2; right: Figure 3

$$CaO = 1.86SiO_2 + 2.2Al_2O_3 + O.7Fe_2O_3 + f.CaO^4$$

which assumes the compounds

$$xC_2S + yC_4A + zO_2F + f.CaO$$

Janecke has not consented to this, because his so-called Janeckeit is not directly referred to, but indirectly as

$$2C_2S + C_4A = C_8AS_2$$

(8) Guttmann und Gille; Das Mangan im Zementklinker, zugleich ein Beitrag zur Konstitutionsfrage des Zementes. Zement 18 (1929) 500-6 537-41, 570-4. This formula is for the case

$$O.64 < \frac{Al_2O_3}{Fe_2O_3 + Mn_2O_3}$$

that is, for "aluminatische" cements and Ferrari cements.

(9) Guttmann and Gille; Ibid. This is for the ferritic cements

$$\frac{Al_2O_3}{Fe_2O_3 + Mn_2O_3} < 0.64$$

Kuhl claims that he had proposed the same formula at a meeting, before Guttmann and Gille's paper appeared.

(10) Bogue; Calculation of the compounds in portland cement. Ind. Eng. Chem., Anal. Ed. 1 (1929) 192-7. Although the coefficients are all the same as in (8), in this formula the ternary compound C_4AF is referred to.

For all formulae it is evident that $\frac{m}{n}$ of C_mX_n must be the highest of all values the existence of which has been established by experiments. Therefore the following formulae are incorrect from this standpoint.

Formula (2) $\frac{m}{n} = C_2A$ — is insufficient

Formula (3) $\frac{m}{n} = C_3F_2$ — is insufficient

Formula (4) $\frac{m}{n} = C_{2.5}S$ — is insufficient

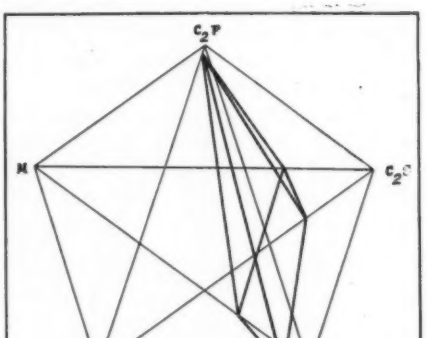
Formula (7) $\frac{m}{n} = C_2S$ — is insufficient

Formula (8) $\frac{m}{n} = CF$ — is insufficient

Formula (9) $\frac{m}{n} = C_2A$ — is insufficient

Formula (4) (5) $\frac{m}{n} = C_3F$ — is overvalued

Formula (7) C_4A—neither this compound nor C_8AS_2 actually exists.



• Figure 4

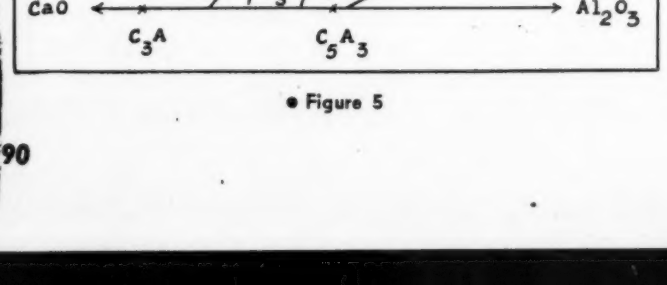
There remain only two formulae (6) and (10)[5]. They are the basis of the recasting, which is called Nagai-Bogue's classical calculation. By the word classical, it is meant that only stoichiometrical relations are involved, not the phase diagram. As already pointed out, the connecting line $C_3S - C_3A$ lies entirely on the field of lime. For product such as modern portland cement, which is made by quenching clinker taken from rotary kiln and cooler, equilibrium is hardly attained during cooling, especially in the solid states range, so the resorption of free lime is scarcely realized. This is the reason why the lime saturation degree of Kuhl

$$\frac{CaO}{2.8SiO_2 + 1.65Al_2O_3 + O.7Fe_2O_3}$$

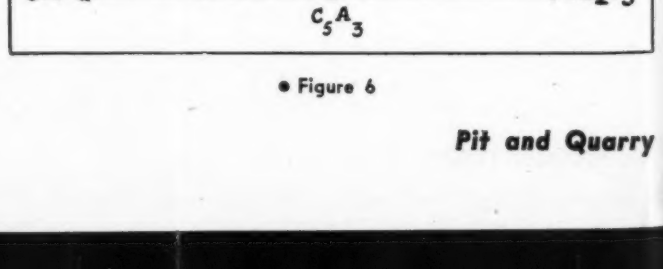
which is correct in view of compound association usually gives lower values than in reality, and necessitates enlarging coefficients such as Hess's and Spindel's. Lea and Parker's formula is based partly on stoichiometrical relations (for C_3S) and partly on the phase diagram (α).

[4] f. = free.—Ed.

[5] However, Table 1, shows that (10) is the same as (8).—Ed.



• Figure 5



• Figure 6

Formulae Derived from Phase Diagrams

In the phase diagram, saturation will take place on the phase boundary curves. For example, as shown in Fig. 1, three components A, B and C, say C_2S, MgO and CaO, give a ternary eutectic e, where the boundary *bea* is the situation curve of C (lime). In the case of portland cement, both C_3A and C_3S, the aluminate and silicate of the highest lime contents, have incongruent melting points, and the lime saturation curve lies beyond the connecting line of C_3A–C_3S. But fortunately the curve is much straighter than in the case of eutectics. Cement formulae which are linear in terms of component content express a straight line or plane. At the Stockholm symposium in 1938, Lea himself showed that his formula, proposed with Parker, is based on the following 3 points and represents a plane in the tetrahedron of

CaO-Al_2O_3-Fe_2O_3-SiO_2:

Composition point for C_3S
Composition point for C_4AF
Invariant point for CaO-C_3S-C_3A

However it is more desirable that other known points on the lime saturation face be used.

In Lea and Parker's diagram, the following points are given:

		CaO	SiO_2	Al_2O_3	Fe_2O_3
K	CaO-C_3S-C_2S	68.4	22.4	9.2	...
D	CaO-C_3S-C_3A	59.7	7.5	32.8	...
T_1	CaO-C_3S-C_3A-C_4AF	55.0	5.8	22.7	16.5
X	CaO-C_3S-C_4AF	52.8	5.6	16.2	25.4

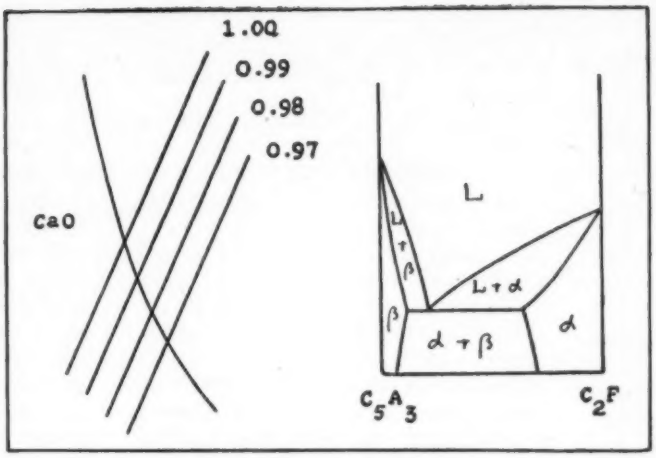
As three points determine a plane, the following formulae can be derived:

D-K-T_1 $CaO =$
$2.55SiO_2 + 1.24Al_2O_3 + 0.74Fe_2O_3$
D-K-X $CaO =$
$2.54SiO_2 + 1.25Al_2O_3 + 0.73Fe_2O_3$

As both planes have almost the same coefficients, it is evident that the lime saturation degree is expressed by only one formula without regard to the magnitude of the iron modulus. For this reason, it is not right to have two formulae for lime saturation.

Since the line D-K crosses the field of C_2S, which is lower in lime content than C_3S, the above two formulae are both insufficient. Therefore it is better to adopt the composition point of C_3S instead of the point K.

As regards the quaternary invariant point, newer data are available. Swayze (1946) has given the following:



• Left: Figure 7; right: Figure 8

SiO_2 5.8, CaO 53.9, Al_2O_3 21.2, Fe_2O_3 19.1 (1342° C)

Using these data and the other two points C_3S and D, we have the plane which passes through the three points (s, a and f being the general planar co-ordinates of SiO_2, Al_2O_3 and Fe_2O_3).

s	7.5	26.3	5.8
a	32.8	0	21.2
f	0	0	19.1
1	1	1	1

$= O$

This gives the cement formula
$CaO =$
$2.8SiO_2 + 1.18Al_2O_3 + O.66Fe_2O_3$
which is nearly the same as that of Lea and Parker.

Formulae Extended to Include Minor Constituents

Lea has shown another formula, which deals with magnesia instead of iron oxide, i.e.
$CaO =$
$2.8SiO_2 + 1.18Al_2O_3 - O.93MgO$
This formula represents the plane, which is shown in Fig. 2 as a tetragon. The plane represented by the formula
$CaO =$
$2.8SiO_2 + 1.18Al_2O_3 + O.66Fe_2O_3$
is the triangle of Fig. 3.
The two formulae need not be separately considered. We can combine them simply as follows:
$CaO =$
$2.8SiO_2 + 1.18Al_2O_3 + O.66Fe_2O_3 - O.93MgO$

It is also possible to combine the triangle and the tetragon. A method for graphical representation of a five-component system has been proposed by R. Kimura (The report of the Institute of Science and Technology, The University of Tokyo, *1* (1947) 31-5, 41-4, 145-9). In four-dimensional space a regular pentahedroid is considered, and a projection is made onto a plane. By making the projection a regular pentagon, we can represent the system fully symmetrically. The tetragonal pyramid shown in Fig. 4 is the section of the pentahedroid and represents the lime saturation front, that is, a super-plane in the four-dimensional space.

Besides magnesia, further components such as sodium and potassium are to be considered.

The super-plane which has the intercepts S, A, F and M on each axis and passes through the point $x(SiO_2, Al_2O_3, Fe_2O_3, MgO, X_mO_n) = x(p, q, r, u, v)$ is given by the equation:

$$\begin{vmatrix} s & S & O & O & O & p \\ a & O & A & O & O & q \\ f & O & O & F & O & r \\ m & O & O & O & M & u \\ x & O & O & O & O & v \\ 1 & 1 & 1 & 1 & 1 & 1 \end{vmatrix} = O$$

Solving this we have

$$\frac{s}{S} + \frac{a}{A} + \frac{f}{F} + \frac{m}{M} + \frac{x}{X} = 1$$

where $X = \dfrac{v}{1 - \frac{p}{S} - \frac{q}{A} - \frac{r}{F} - \frac{u}{M}}$

On the other hand if the cement formula is
$CaO = \sigma SiO_2 + \alpha Al_2O_3 + \phi Fe_2O_3 + \mu MgO + \xi X_mO_n$
where the sum of all components is unity

$$CaO + SiO_2 + Al_2O_3 + Fe_2O_3 + MgO + X_mO_n = 1$$

therefore

$$(1+\sigma)SiO_2 + (1+\sigma)Al_2O_3) + (1+\phi)Fe_2O_3 + (1+\mu)MgO + (1+\xi)X_mO_n = 1$$

hence

$$\frac{1}{1+\sigma} = S, \quad \frac{1}{1+\sigma} = A, \quad \frac{1}{1+\phi} = F,$$

$$\frac{1}{1+\mu} = M \quad \frac{1}{1+\xi} = X$$

The case $Na_2O = X_mO_n$. The ternary system $Na_2O - CaO - Al_2O_3$ has been studied by Brownmiller and Bogue (1932). In Fig. 5 the invariant point nearest the $CaO - Al_2O_3$ axis and situated on the lime front is an eutecto-peritectic point,

having the composition
Al_2O_3 44%, Na_2O 6%, CaO 50% (1490°C).

Putting the above values and A =0.4587[6] in the formula we have

$$X = \frac{0.06}{1 - \frac{0.44}{0.4587}} = \frac{1}{1+v} = 1.47$$

Solving this we have the coefficient

$$v = -0.32$$

The intersection of the lime saturation and the Na_2O–Al_2O_2 planes is shown by the dotted line in Fig. 5.

The case $K_2O = X_mO_n$. The ternary system $K_2O - CaO - Al_2O_3$ was studied also by Brownmiller (and Work) (1935) see Fig. 6). The point of known composition which can be used for the determination of the coefficient κ is:

Peritecto-eutectic point at 1486° C.

Composition: Al_2O_3 44.7%, K_2O 6.5%, CaO 44.8%.

From here on the development is quite analogous to that above, and we have from

$$X = \frac{0.065}{1 - \frac{0.447}{0.4587}} = 2.55$$

the coefficient $\kappa = -0.61$

It is indifferent whether the compound is binary (KA) or ternary (NC_8A_3); even its composition has no relation.

The above is an example of attempts at determination of v, κ and also μ, but it is more desirable that an "inner" point, which will fulfill all the co-ordinates of x (p, q, r, u, v), be given.

For TiO_2 and Mn_2O_3 no phase diagram is available, but titanium oxide seems to have a coefficient of nearly the same order as that of silica, and manganese oxide seems to replace iron oxide.

[6]Derived from=1.18.—Ed.

Considering the corrections for gypsum and free lime, the cement formula will be:

$$CaO - 0.7SO_3 - f.CaO = 2.8SiO_2 + 1.18Al_2O_3 + 0.66Fe_2O_3 - 0.93MgO - 0.32Na_2O - 0.61K_2O$$

In Table 2 are shown results obtained recently in our laboratory. Although the cements were not marked as rapid-hardening, there are some for which the value of the lime saturation degree exceeds unity. This is probably accounted for by the existence of free lime, which we have not yet determined. However, since the cement formula is a linear approximation to the lime saturation front, unity may in some cases be exceeded. (See Fig 7.)

Remarks

(1) The Swayze diagram is based on the fact that C_2F is a congruent[7] melting compound, but this was first pointed out by Dr. Yamauchi. (Study on the celite part., Jour. Jap. Ceram. Assn. *45* (1937) p. 291. He prepared pure C_2F and observed on heating it up to 1470°C that there occurs neither dissociation nor transformation. His conclusion is clearly represented in the pseudo-binary phase diagram of C_5A_3 –C_2F. (See Fig. 8, originally in loc. cit. p. 630.)

Dr. Yamauchi was also the first to extend the solid solution range of the iron bearing phase beyond C_4AF to C_2F. For the extreme member of the solid solution series he gave

$$5C_2F.3C_5A_3.2C_3A = C_{6.2}A_{2.2}F$$

instead of C_6A_2F, which he also prepared but regarded as merely a member of the series. In this paper it is of no interest whether celite is a definite compound C_4AF or a solid solution with extreme member

$$C_{6.2}A_{2.2}F \text{ or } C_6A_2F.$$

(2) So far as the four components CaO, SiO_2, Al_2O_3 and Fe_2O_3 are concerned it is better, as Kuhl said, to replace the hydraulic modulus by the lime saturation degree, but when a fifth component is added, four coordinates are needed for fixation of the point in the four-dimensional space. For this purpose lime saturation degree together with hydraulic modulus, silicate modulus and iron modulus can be used. Further addition of one or two components will necessitate the introduction of more ratios, say such as "kali-ratio"[8] and "soda-ratio". How to choose them is quite arbitrary, but the following may be considered: "Kali - ratio" $\frac{M}{K+N}$;

"Soda - ratio" $\frac{M}{N}$ or $\frac{K}{N}$

(3) For aluminous cements, a considerable number of investigations have been carried out to determine the most favourable composition, but Kuhl has concluded that there is no single compositional formula valid for aluminous cements. The reason is that for aluminous cements the effective compounds C_5A_3, CA, C_3A_5 and C_2S have no front in common, on which the best quality is expected, so a single plane could not be fitted thereon.

(4) Parallel to lime saturation of portland cement, silica saturation is a problem of petrology. For plutonic rocks equilibrium is more nearly attainable, so the above considerations may not be applicable. Furthermore, if the rock formation is not dry, but pneumatolytic or hydrothermal, the experimental model can scarcely be made, so we have no phase diagram to apply.

For effusive rocks, the condition is somewhat the same as for portland cement. But today we have

[7]The word "incongruent" was used in the author's manuscript but evidently "congruent" was intended.—Ed.

[8]Potash ratio.—Ed.

(*Continued on page* 94)

Table 2.
Chemical Composition and Lime Saturation Degree of Some Portland Cements.

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10	Sample 11	Sample 12	Sample 13	Sample 14	Sample 15	Sample 16	Sample 17	Sample 18	Sample 19	Sample 20	Sample 21	Sample 22	Sam 23
CaO...	62.18	63.10	62.44	62.71	62.94	61.52	61.51	61.97	61.17	63.29	63.93	63.24	60.57	60.74	63.63	62.94	62.36	62.77	62.94	62.09	61.60	63.43	63.
SiO_2...	17.88	21.16	20.85	21.93	21.08	20.28	20.49	19.33	18.81	21.33	21.13	19.52	22.16	22.10	21.88	21.86	22.76	22.82	22.74	22.94	20.92	21.17	21.
Al_2O_3..	7.14	4.35	5.27	4.34	5.08	5.81	5.51	5.44	6.08	4.33	5.95	7.71	6.92	7.69	5.90	5.96	5.60	5.77	5.68	5.32	6.82	6.79	8.
Fe_2O_3..	5.51	4.43	4.16	3.89	3.89	3.76	3.76	3.76	3.49	4.34	3.09	2.82	2.68	2.55	3.23	3.23	3.23	3.36	3.43	3.43	3.16	2.82	2.
MgO...	1.52	2.50	2.39	2.25	2.19	2.20	2.29	2.51	2.85	2.30	1.36	1.34	1.54	1.68	1.45	1.82	1.86	1.89	1.84	1.84	2.06	1.21	1.
Na_2O...	0.31	0.54	0.54	0.52	0.53	0.51	0.51	0.53	0.53	0.41	0.41	0.65	0.68	0.65	0.40	0.55	0.52	0.42	0.54	0.28	0.47	0.56	0.
K_2O....	0.59	0.32	0.32	0.31	0.31	0.35	0.30	0.31	0.31	0.42	0.52	0.71	0.81	0.79	0.42	0.31	0.35	0.52	0.33	0.49	0.28	0.63	0.
SO_3....	2.08	1.79	1.70	2.20	1.72	2.46	2.50	2.11	1.91	1.34	1.31	1.93	1.68	1.66	1.46	1.47	1.46	1.09	1.07	1.22	1.55	1.90	1.
MnO...	0.10	0.29	0.24	0.19	0.21	0.20	0.15	0.13	0.18	0.22	0.09	0.38	0.09	0.14	0.13	0.05	0.16	0.08	0.17	0.17	0.08	0.06	0.
Ign. loss	1.81	1.63	1.78	1.64	1.81	2.40	2.47	2.46	3.09	1.05	1.28	1.35	2.46	1.75	0.96	1.31	1.59	1.11	1.14	1.71	2.25	1.15	1.
Insol...	1.49	0.34	0.72	0.32	0.71	1.10	1.02	1.48	1.60	0.88	0.92	0.24	0.47	0.39	0.68	0.76	0.34	0.52	0.48	0.56	0.87	0.41	0.
Total..	100.61	100.45	100.41	100.30	100.47	100.59	100.51	100.03	100.02	100.00	99.99	99.89	100.06	100.14	100.13	100.26	100.23	100.35	100.36	100.05	100.06	100.13	100.
h.m....	2.04	2.11	2.06	2.08	2.09	2.06	2.07	2.17	2.16	2.10	2.12	2.10	1.91	1.88	2.05	2.03	1.97	1.96	1.98	1.96	1.99	2.06	2.
l.s.d.*..	1.01	0.96	0.95	0.92	0.95	0.94	0.94	1.00	1.01	0.96	0.95	0.97	0.85	0.85	0.91	0.91	0.87	0.88	0.88	0.87	0.91	0.92	0.

*Lime saturation degree:

$$L.S.D. = \frac{CaO - 0.7SO_3 - f.CaO}{2.8SiO_2 + 1.18Al_2O_3 + 0.66Fe_2O_3 - 0.93MgO - 0.32Na_2O - 0.61K_2O}$$

Men of the Industry—Vern Schield

Shovel manufacturing, at first a sideline, is now the major business of agricultural limestone producer.

VERN SCHIELD came to Bremer county, Iowa, during the early thirties from Minnesota, where he had spent most of his earlier years on a farm. Lacking financial support but rich in enthusiasm and natural mechanical ability, young Schield was attracted to the possibilties of an agricultural limestone deposit near Waverly. Although the soft-lime quarry had been worked by three companies, each of which had discontinued operations due to financial difficulties, Schield's appraisal of its potentialities reflected his keen insight.

This particular stratum of limestone is approximately 30 ft. deep and consists of a very unusual deposit of soft, calcareous material which is easily recovered with a dragline.

With little more than a hand shovel and a strong back the former Minnesota farmer was able to produce a sufficient volume of agricultural limestone to offset immediate expenses. Realizing, however, the need for more efficient production the young operator called upon his native ingenuity to devise some mechanical means for crushing the limestone slabs. For this purpose he salvaged a corn shredder head from an old piece of equipment and mounted it on a home-made frame.

From this modest beginning Schield's quarry operations soon began to pay dividends. The agstone production steadily increased from 900 tons per year in 1932 to more than 60 tons per hour in 1946.

Although the story of Vern Schield's success as a quarry operator is spectacular it is not unique. The most unusual chapter in his life began with his development of the "Bantam" shovel.

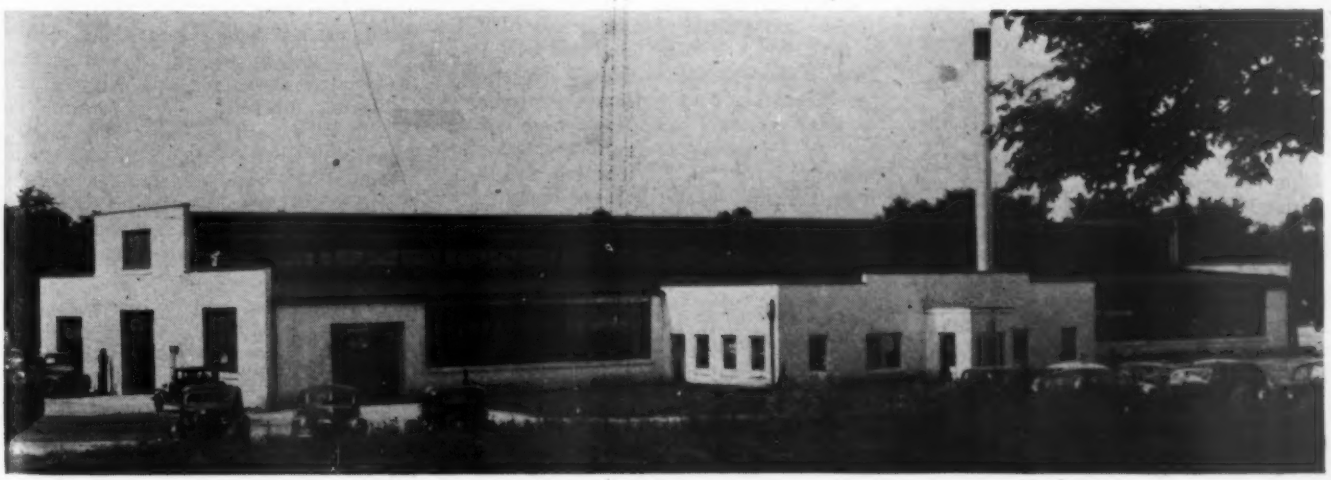
Foreseeing the need for a small portable shovel, dragline, and trench hoe, Schield, equipped with little more than an idea and the well-founded belief that arc-welding would simplify his problems, designed and built the first model of the "Bantam" shovel in a blacksmith shop in Shellrock, Iowa. The first machine took several years to build, but when all the parts were assembled the machine worked—and well.

In 1945 Vern Schield started producing these small truck-mounted shovels in earnest. During that year 35 machines were finished in the machine shop at the agstone quarry. To provide more adequate manufacturing and distribution facilities, Vern Schield organized and formed the Schield Bantam Company, which was incorporated under the laws of Iowa in 1946. Vern's brother, Wilbur, came into the company and is production manager.

Today the Schield Bantam Com-

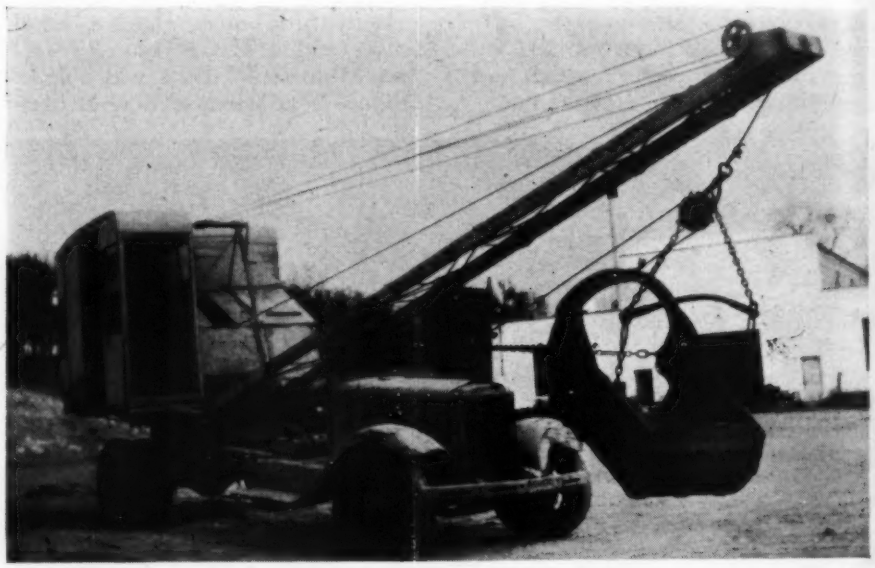
• Wilbur Schield (left), vice-president and general manager, talks things over with Vern Schield, president of the Schield Bantam Company. The company-owned plane is constantly in use to speed up delivery of replacement parts.

• Below: A general view of the new plant of the Schield Bantam Company, Inc., at Waverly, Ia. Approximately 70 percent of the total outside wall area is of glass. Manufacturing facilities now permit production of 10 machines per week.



• One of the new models of the Bantam shovel now in production at the plant near Waverly.

• The original model of the Bantam shovel. This machine was built in a blacksmith shop and took several years to finish.



pany employs some 130 persons with weekly payrolls totaling nearly $5,000. In the ultra-modern plant, erected on an 11-acre site outside Waverly, production of the Bantam has been upped to 10 machines per week, with approximately half of the total output mounted on trucks supplied by the customer.

As a natural accompaniment to increased production and distribution of the "Bantam," the company expanded its staff of field engineers, whose job is primarily one of service to the customer. In addition, the company maintains its own plane to facilitate speedy field service and quick replacement of parts.

Nolan Stone Co. Sells Out to Eastern Rock Products, Inc.

A landmark of Prospect, N. Y., the quarry and plant of the Nolan Stone Company, passed into new ownership recently when the property was sold to Eastern Rock Products, Inc., a firm operating several quarries in New York.

The purchasing firm owns a sand-and-gravel plant near Boonville and a sand pit in Barneveld, N. Y. At Oriskany Falls, N. Y., it operates a quarry, an agricultural lime plant and an asphalt mix plant. Officers of Eastern Rock Products include the following: Harold V. Owens, president; John V. Owens, vice-president in charge of production; C. A. Munz, vice-president in charge of sales; H. H. Kerwin, treasurer.

Cement Formulae

(*From page* 92)

only ternary phase diagrams in which the temperature is yet so high that silica does not appear as quartz but as cristobalite or tridymite. It is expected that the quaternary diagrams in which quartz will appear will soon be established.

Mitchell Heads Fire Protection Section of Standards Bureau

Nolan D. Mitchell, prominent in architectural and engineering fields, has been appointed chief of the Fire Protection Section of the National Bureau of Standards, where he will direct further research for the Building Technology Division on problems of fire-resistance in relation to the design and construction.

Mr. Mitchell has served as a member of several technical committees of national scope, including those on Building Regulations for Reinforced Concrete, Building Code Requirements for Fire Protection and Fire Resistance, Building Code Requirements for Chimneys and Heating Appliances, and Methods of Fire Tests of Building Construction and Materials. He is a member of the Washington Society of Engineers, the American Concrete Institute, the American Society for Testing Materials, the National Fire Protection Association, and Sigma Xi.

Sulphur Production Doubled But Price Stays at 1938 Level

According to an announcement made by officials of the Freeport Sulphur Company, sulphur production in Louisiana has more than doubled in the last 10 years. The entire output of the state, it was revealed, comes from Freeport's Grande Ecaille mine in the Plaquemines Parish, which is now producing more than 2,500 tons of sulphur a day.

Contrary to expectation, the price of sulphur has not followed the production volume curve. Due to increased production and efficiency and also to sharp competition from operations in other states, sulphur, priced at $18 per ton (at the mine) in 1938 is still $18 per ton.

Month's Freight Car Output Tops 10,000 for Second Time

Of interest to PIT AND QUARRY readers is the report recently published in the press on freight car output in August. The total figure for cars finished in that month stood at 10,362. It is the second time that monthly output has exceeded 10,000 since the announcement of this figure as a monthly goal was made in March, 1947. In July 8,706 cars were delivered; in June, 10,381.

August deliveries comprised 7,450 from the car-building industry and 2,012 from railroad shops. Orders placed in August were for 3,739 cars, as against 11,923 in July. Orders on hand on August 31 were for 118,138 cars, as against 113,680 on August 31, 1947.

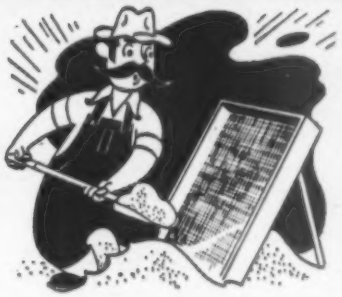
Leviathan Snorting Again After Siesta of Several Years

Sulphur production has been resumed at the Leviathan mine near Markleeville, Calif., after a long period of inactivity. The material is trucked from the mine to Minden, Nev., for rail shipment to California markets. The operation is said to be located on one of the largest deposits of native sulphur in the West.

Operations were discontinued before World War II because of the unfavorable sulphur market at that time and the inability of the operators to compete profitably with Texas sulphur producers.

GATX: A History of the General American Transportation Corporation, by Ralph C. Epstein, traces the career of this organization from 1898 to 1948. A large number of photographs appropriately illustrate the diversified phases of the firm's activities and development.

Screenings



by William M. Avery

THE cement industry received a plug the other day from a wholly unexpected source, and we've been waiting with bated breath for repercussions. Miss America of 1948, who has, so far as we can discover, no proprietary interest in the portland cement industry, tossed this epic fragment

Beatrice Shopp, Miss America 1948

to reporters who interviewed her right after the annual cheese cake festivities at Atlantic City: "I am only a farm girl. I drive a tractor. I clean the chicken coops. I mix cement."

It isn't altogether clear whether or not "Bebe" intended this as a formula for success in the Miss America sweepstakes, but it will do until somebody comes along with a better one. Since the poultry industry product referred to is a bit deficient in glamour, we think the cement industry should start negotiating immediately for an even more explicit endorsement of its product, along with suitable photographs of "Bebe" in the act of mixing. A national advertising program built around such copy would serve at least two purposes: (a) it would prove that *some*body can get cement; (b) it might, for a few moments anyway, help the public to forget the shortage.

If the industry can't scrape together enough cement for Miss America to demonstrate her technique, we know a guy who has half a bag he'll swap for a 6-room house and a 1948 Cadillac. Note to Bill Allan, director of promotion for the Portland Cement Association: We'll be glad to donate our services for the purpose of opening direct negotiations with "Bebe." No trouble at all, Bill. Glad to help.

Ways and Means

WISCONSIN authorities are reported to have started pumping operations on two abandoned gravel pits in Wauwatosa township in their search for a nearby resident who has been missing for several months. If the owner of the pits

should just happen to resume operations in the near future, a lot of suspicious folks, including ourselves, are going to wonder if he may not have used the mysterious disappearance as a pretext for having the pumping job done at the taxpayers' expense. We're such a curious species that if somebody circulated a rumor that there was a body in the foundation of Grand Coulee Dam, the authorities would probably start dismantling operations immediately.

Hazards

WHILE we're on this morbid topic, we're reminded of a recent Bureau of Mines release which points out that there are insufficient laws governing abandoned mines, pits and quarries where "death lurks in many forms." The Bureau of Mines generally knows what it is talking about, but we have a hunch that the forms of death they have in mind can no more be controlled by legislative action than can the forms that lurk in bath tubs, on cellar steps and home stepladders.

Fact of the matter is that year in and year out more people seem to die in bed than any other place, but to date nobody has proposed legislative intervention.

Fair Exchange

A CHAP on the West Coast has brought a $3,000 damage suit against a storage company on the grounds that a 300-pound box placed in storage 18 months ago weighed 400 pounds when it was returned to him. His complaint alleges that *his* box contained a varied supply of fine bourbon, Scotch, rye, and French cognac, whereas the one returned to him was filled with concrete blocks. He seems to suspect that his liquid

assets were disposed of by agents of the company.

For our part we think the company agents were surprisingly considerate. Not many guys, after downing 3,000 buck's worth of somebody else's liquor, would be clearheaded and thoughtful enough to supply the victim with materials for building a wailing wall.

Self-Propelled Earth- And Transport Pit-Run

another ON THE SPOT report

PACIFIC Coast Aggregates, Inc., of San Francisco is one of the "name" organizations in the pit and quarry industries. Although it deals in a wide variety of building materials in the San Francisco and central California region, and is a large-scale ready-mixed-concrete operator with a score of batch and premixing plants, the mainstay of its business continues to be the production of aggregates. Its sand, gravel and crushing plants, a dozen or so in number, are strategically located and range from medium-size to extreme-

By HARRY F. UTLEY

ly high-capacity operations. Shortly to go into production, for example, is the concern's new Eliot plant, with a scheduled output of about 1,000 t.p.h. of washed and sized material.

The company maintains a well-equipped and well-staffed engineering department that is constantly studying and analyzing production methods in the interest of efficiency and economy. When it adopts a new way of doing things, therefore, relegating the older practices into the discard, it becomes important industry news.

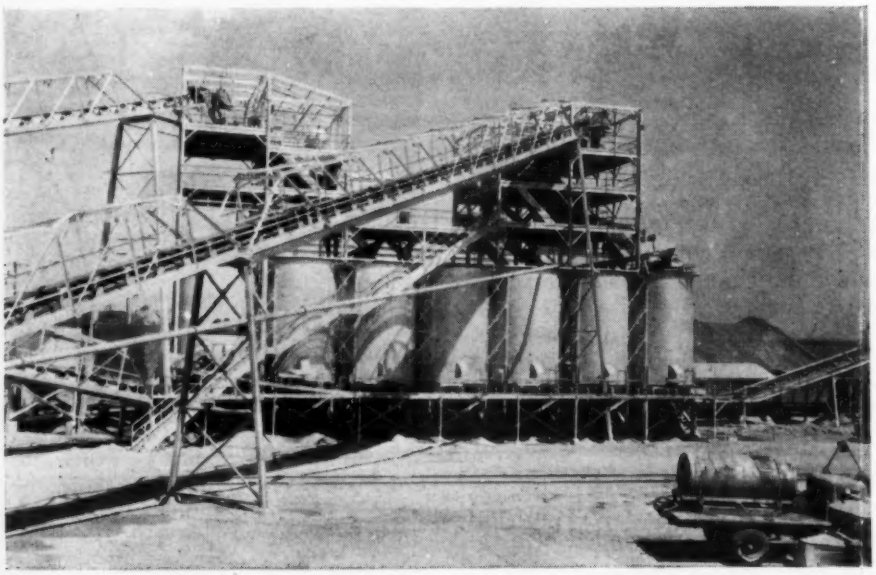
That is apparently what is happening to the firm's operations with respect to excavating, loading and intraplant transportation. From a small test setup with a modern high-speed, high-capacity self-propelled scraper performing all of these functions, it has to date enlarged this to a fleet of 10 such earthmovers, which are harvesting the bulk of the company's pit-run material and doing it at amazingly low cost.

The development came about as a cooperative effort between P.C.A. engineers and those of the Wooldridge Mfg. Co. of Sunnyvale, Calif. The fleet now in service consists of 10 Wooldridge "Terra Cobra" scrapers, each of which can load, carry and dump 15 cubic yards of material per trip. The units are self-propelled, powered by 150-hp. Cummins diesel engines, and can travel as fast as 17 m.p.h. fully loaded.

The first Cobra began operating at Pacific Aggregate's Olympia sand plant about a year ago. Excavating and delivery to the plant hopper had been accomplished by a cable-operated drag-scraper; but the supply of accessible material was nearing exhaustion, and lengthening the system to encompass a new supply was felt to be impractical. Accordingly, the Cobras took over the job of digging and hauling the sand to a point within easy reach of the existing dragscraper. Over a period of several months they had moved in 200,000 tons—enough to keep the sand plant in operation for a year—

• Three of the screens in the Kerlinger, Calif., sand-and-gravel plant of Pacific Coast Aggregates, Inc.

• A view of the Kerlinger plant, showing the road rock plant at the right and the batching plants at the left.



• The all-steel screening plant and conveyor structures at Kerlinger. Each of the 14 steel loading bins below has a capacity of 250 tons.

Movers Excavate, Load at West Coast Plant

at a cost of about 13 cents per ton, including equipment write-off.

This performance record convinced the management that the earthmovers might well replace the conventional digging, loading and transporting equipment at its various sand and gravel operations. The Cobras were relatively low in first cost, compared with the equipment in use; operating expense had proved to be considerably less; fewer man-hours were required to deliver a given tonnage to the plant hopper; and the dry pits were well suited to this type of operation.

One Terra Cobra went into use at the old Eliot plant, replacing a 2½-cu. yd. dragline and two quarry-type trucks. When the new 1,000-t.p.h. Eliot plant begins operating, four of the Cobras are expected to be placed in service to supply all the raw material.

Another unit is operating at the company's Centerville plant and pit. When production got underway last year at the new Kerlinger plant south of Tracy, Calif., a 2½-cu. yd. power shovel originally excavated the material, delivery to the plant being accomplished by a system of field conveyors. This was abandoned, however, in favor of the self-propelled scrapers and three of the Terra Cobras are now permanently stationed at Kerlinger.

The Kerlinger operation has provided the best example of the method so far. A portion of the 600-acre deposit was stripped and the old pit bank graded to a gentle slope to accommodate the scrapers, as seen in the accompanying

• Seven of the scrapers in the Pacific Coast Aggregates fleet at Olympia, Calif.

• An aerial view of the Olympia sand operations. The cut at the upper center shows the pit where the scrapers worked to build up the stockpile.

• Looking into the 6- by 30-ft. revolving screen and scrubber at Kerlinger.

photographs. The Cobras are loaded by a "push-cat" . . . a dozer-equipped "Caterpillar" tractor which applies the digding power from the rear by pushing against a large-diameter spring-loaded "button" on the back of the scraper frame. The loading area in the main pit is slightly downgrade to the hopper, the empty units returning by road, which is partly 5-percent grade, to the pit. The round-trip haul is about 1,700 ft.

Time studies of the operation have revealed some interesting data. Gross machine-hours for the three Terra Cobras for on 8-hr. day (24 hrs.) breakdown like this:

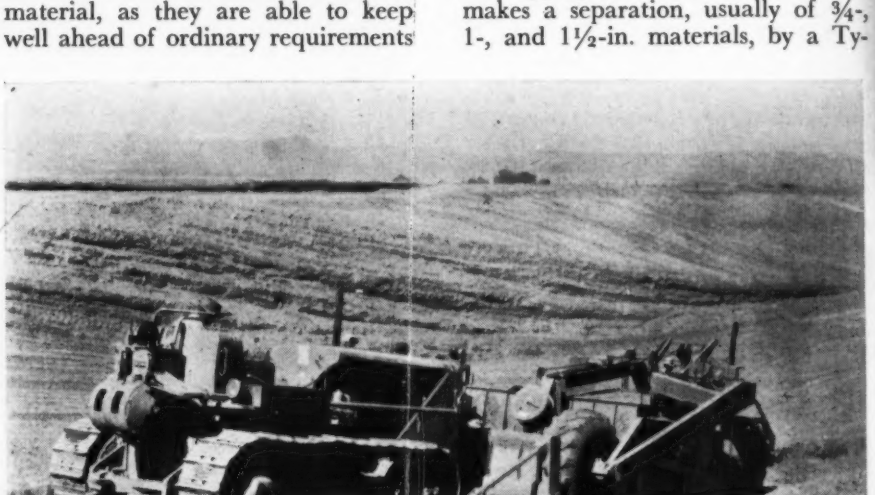
	Hours	Percent
Round-trip haul and dumping	17	71
Loading time	3	13
Waiting time in cut	1	4
Waiting time at hopper	1	4
Mechanical delays	1	4
Operational loss time.	1	4
Total	24	100

It has proved possible for the three Cobras to make a total of nearly 300 round trips per day, excavating, loading, hauling and dumping about 4,500 cu. yds. into the 40-ton hopper which feeds the conveyor leading to the processing plant. The average trip and dump time is usually slightly under 4 minutes. Loading time per unit takes about 2/3 minute over a loading distance of about 75 ft. The average yardage hauled per hour per unit is about 185.

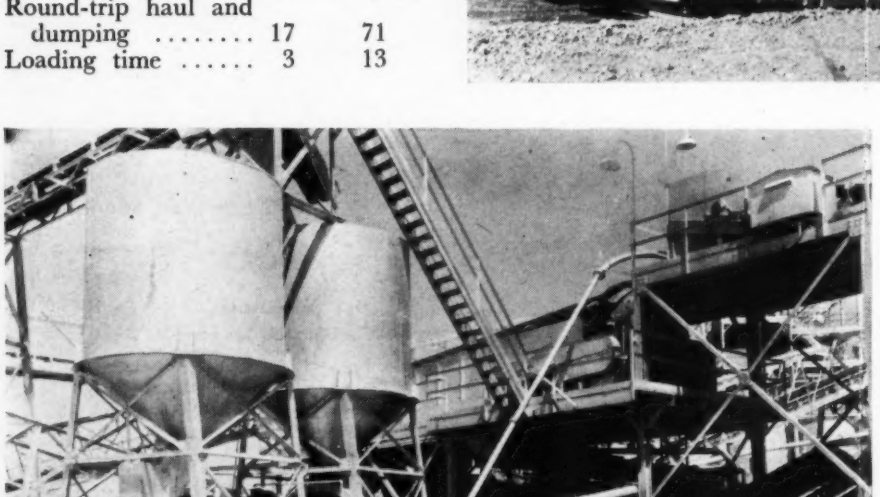
Much of the time, however, only two Cobras are used to harvest the material, as they are able to keep well ahead of ordinary requirements of the screening and crushing plant. The third unit is in stand-by service. The Kerlinger plant has an hourly processing capacity of about 400 tons of commercial aggregates and road rock.

Since publication of an earlier progress story on the Kerlinger plant in PIT AND QUARRY (October, 1948) the plant has gone into full-scale production and is kept busy in large part supplying material for the Central Valley Project's Delta-Mendota Irrigation Canal. Shipments run as high as 1,800 tons per day.

From the hopper fed by the Cobras, a 36-in. by 400-ft. conveyor carries the pit-run to a surge pile. A T-shaped reclaiming tunnel can supply material from this storage to either the unwashed rock-rock, or the aggregates plant. The former makes a separation, usually of ¾-, 1-, and 1½-in. materials, by a Ty-



• A bulldozer-equipped tractor applies the digging power from the rear by pushing the scraper in the loading operation.

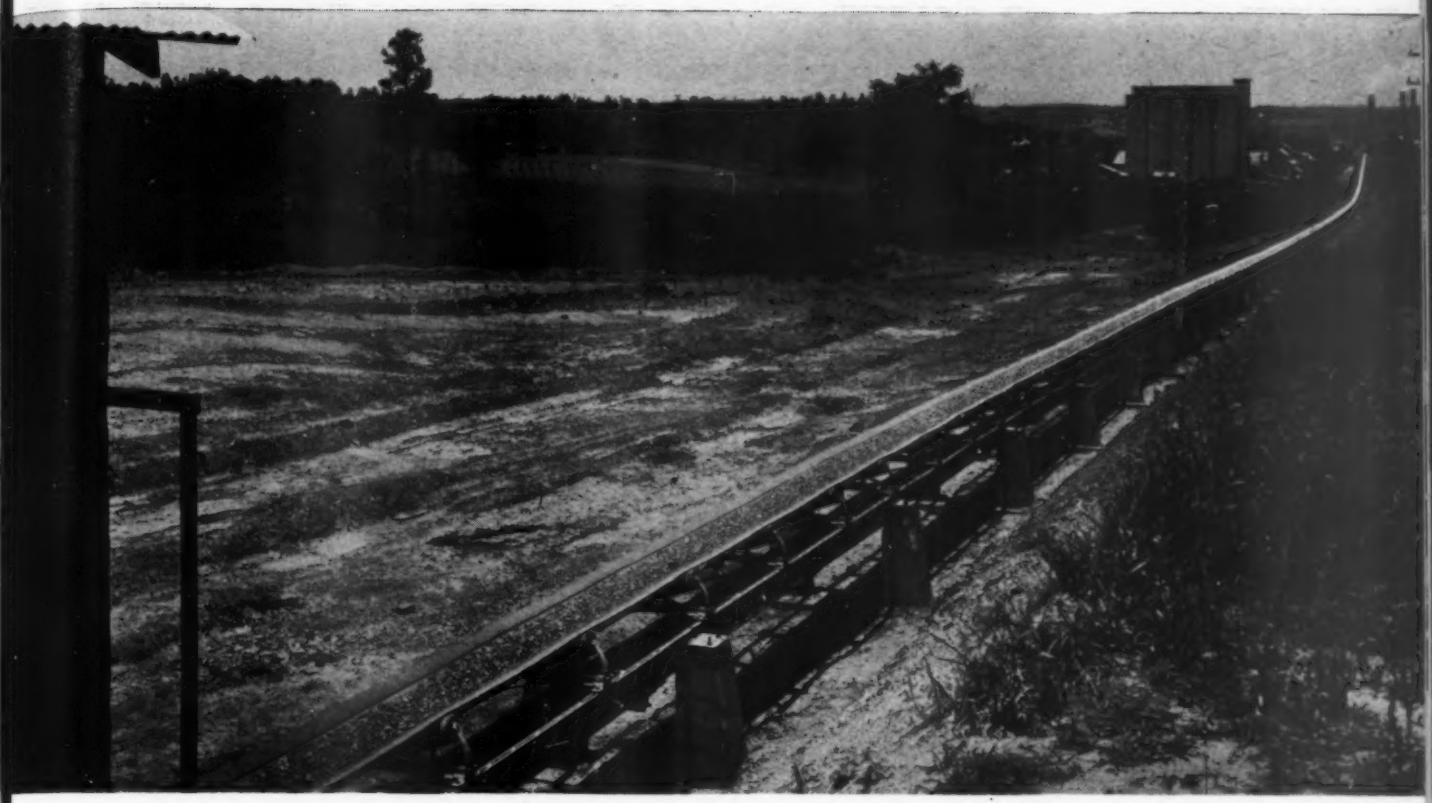


• The two steel bins at the left feed each end of the rod mill, manufacturing ground sand from surplus pea gravel. The mill has peripheral discharge.

Rock 5- by 10-ft. double-deck screen with a Symons 4-ft. cone in closed circuit. Output is chuted directly to cars or conveyed to truck-loading bins.

The flow to the concrete-aggregates plant involves an initial scrubbing of the material. The first pass is through a Yuba 6- by 30-ft. trommel scrubber, fines being subject to further treatment in Dorr duplex rake classifiers and Wemco 48-in. triple screws. Primary crushing is handled by a Gate 5K gyratory, further reduction taking place in a Farrell 10- by 36-in. jaw crusher and Symons 4-ft. and 3-ft. cones. Scalping and sizing operations are accomplished by six or seven Ty-Rock double- and triple-deck

(*Continued on page* 102)



• A view of the one and a quarter mile long conveyor at the National Cement Company's plant at Ragland, Ala.

Electric Power Reduces Haulage Costs at Ragland Cement Plant

By WALTER F. CHRISTIAN
Industrial Power Division
Alabama Power Company

WHEN the National Cement Company, Ragland, Alabama, decided to open a new quarry one mile from its plant, rail-haulage system was discontinued and a new belt-conveyor system was installed. The conveyor is a mile and a quarter long and moves the stone and shale from the quarry to the plant over a rolling terrain with many natural and man-made obstacles. It has a capacity of 300 tons per hour and is moving the material at the lowest ton-mile cost in the company's history.

This conveyor system was designed and supplied by the Industrial Division of the Continental Gin Company. The order was placed for the equipment just before Pearl Harbor and construction work was done by a small group of company maintenance workers aided at times by other company employees. Considerable ingenuity was exercised in the construction to avoid the use of new materials which, at that time, were important to the war effort. The transition from the rail-haulage system to the belt-conveyor system was made in stages and without interrupting continuity of production.

Editor's Note: The following article, which appeared in a recent issue of "Southern Power and Industry," is intended here as a follow-up to a staff-written article published in the September, 1943, issue of Pit and Quarry. The original Pit and Quarry article was written shortly after completion of the unique conveyor system at the Ragland, Ala., plant.

Mr. Christian's text is basically the same as the material previously covered in Pit and Quarry and serves, essentially, as a review. His mechanical and electrical data, analysis and cost tabulations are new and represent intensive study of the operational functions of the Ragland plant. They analyze and prove the high efficiency level which this equipment has maintained over a period of more than five years.

This plant, which resorted to highly mechanized production methods in view of labor shortages and other critical problems in 1943, has operated trouble-free since that time.

Only two notable changes in equipment have been made. These are the replacement of steam equipment with a 3-cu. yd. Marion shovel and modernization of truck transportation by the use of two Easton side-dump truck bodies mounted on International chassis. Need for a third truck is anticipated.

The quarry is ideal for cement manufacture as it contains a splendid quality of limestone as well as silica and alumina shales (necessary for making cement). The primary and secondary crushers are located on the floor of the quarry (See sketch). An electric shovel with a 3-cu.-yd. dipper loads the stone into the two 18-ton side-dump trucks. These discharge the stone on a 4½- by 18-ft. apron feeder, which feeds the 42- by 48-in. Allis-Chalmers Superior primary jaw crusher. The minus 6-in. primary crusher product, together with any waste from the apron feeder, is transported to a 36-in. by 102-ft. inclined belt conveyor by a 3- by 25-ft. pan feeder. The 36-in. by 102-ft. belt conveyor discharges the product into a Dixie Mogul hammermill secondary crusher. The minus 1½-in. product from the secondary crusher is discharged on a 30-in. by 95½-ft. inclined conveyor belt, which moves the product to

Tabulation Containing
Essential Information of Conveyor System with Mechanical and Electrical Data

	Width	Centers Length	Rise in Feet	F.P.M.	Tons Per Hour	Installed Motor Hp.	Kw. Load		Brake Hp.		
							Empty	Loaded	Empty	Loaded	Max. Peak
Feeder apron	60"	12' 6"	0' 0"	.....	288	10	2.00	5.00	2.40	6.00	10.00
Feeder apron	36"	29' 8"	0' 0"	.....	288	25	6.50	12.50	7.80	15.00	25.00
Lift conveyor to secondary crusher	36"	101' 11¼"	31' 6"	150	288	20	3.50	13.00	4.20	15.60	25.00
Lift conveyor to surge tank	30"	95' 6"	29' 6"	200	288	20	4.25	15.50	5.10	18.60	27.70
A'	24"	500' 0"	49' 10"	310	288	25	4.30	18.00	5.16	21.60	31.10
A	24"	500' 0"	49' 10"	310	288	25	4.10	17.50	4.92	21.00	82.80
B	24"	1190' 0"	17' 3"	310	288	25	6.25	18.75	7.50	22.50	32.80
C	24"	960' 0"	38' 4"	310	288	25	5.25	17.50	6.30	21.00	32.68
D	24"	1110' 0"	4' 9"	310	288	25	6.25	12.25	7.50	14.70	31.20
E	24"	1092' 0"	11' 9"	310	288	25	5.50	11.25	6.60	13.50	31.20
Total system	.....	5591' 7¼"	232' 9"	.....	288	225	47.90	141.25	57.48	169.50	.....
Total A'ABCDE	.....	5352	171' 9"	.....	288	150	31.65	95.25	37.98	114.30	.....

a 60-ton circular steel surge tank at the foot of the incline from the quarry.

The main conveyor system transports the product from this tank to the storage building at the plant at a rate up to 300 t.p.h. A revolving feeder with an adjustable scraper blade is provided to feed the stone from the tank at the desired rate. The conveyor system is constructed in six sections. Conveyor A, the first of these sections, is 500 feet in length and carries the product about half way up the incline from the quarry, a total rise of 49 ft. 10 in. Conveyor A-1 is identical to Conveyor A and extends to the ground level at the end of the incline. Conveyor B is 1,190 ft. in length, has a total rise of 17¼ ft. and passes under a county highway through a concrete underpass. Conveyor C is 960 ft. in length with a total rise of 38 1/3 ft. Conveyor D is 1,110 ft. in length, has a rise of 4¾ ft. and covers the roughest topography of any section. At one point a cut 15 ft. deep was made through a hill. Conveyor E is 1,092 ft. in length, has a total rise of 11¾ ft. and extends to the raw material storage building at the plant. With the exception of the 15-ft. cut through a hill for Conveyor D, the conveyor system follows the contour of the ground fairly closely.

Electrical Analysis of Tabulation

	Total Conveyor System	Conveyor Belts A',A,B,C, D,E.
Length	5591' 7¼"	5352
Total elevation of material	232' 9"	171' 9"
Material per hour	288 tons	288 tons
Power required	141.25	95.25
Kw.-hr. per ton	.49	.33
Average rate per kw.-hr. (above operation)	$ .0073	$ .0073
Cost per ton material	.0036	.0024

Note: The above cost is based on test when full average load was carried on belts. Electrical shovel, primary crusher, secondary crusher have capacity to supply same.

In the case of irregular quarry operation, when belt is operated continuously (not necessary), the cost per ton for power would be approximately:

	Total Conveyor System	Conveyor Belts A',A,B,C,D,E.
2000 tons daily output	$ .0042	$ .003
1500 tons daily output	.0047	.0034
1000 tons daily output	.0057	.0041

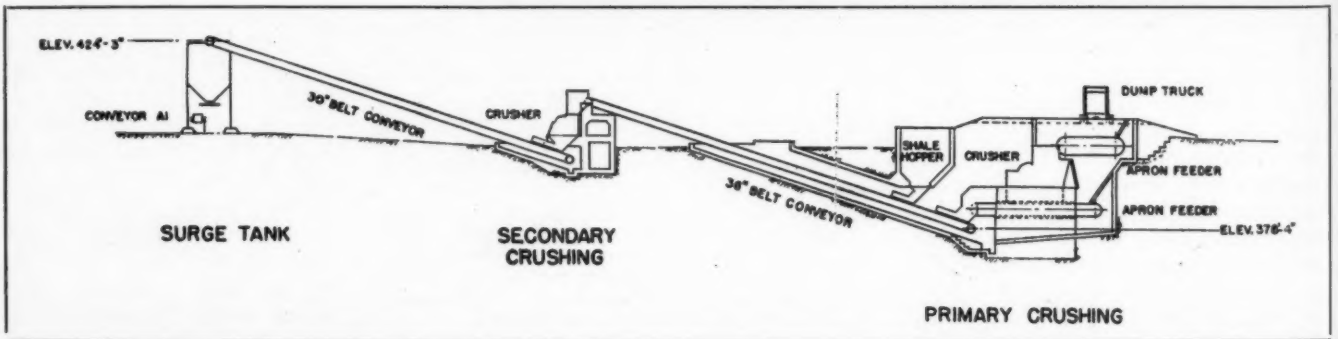
All of the conveyors and transfer stations housing the motor drives are covered with corrugated sheet metal. The carrying idlers are all of 3-roll type with rolls 5-in. in diameter. These rolls are separately removable and interchangeable. Alemite grease fittings are installed with pipes to the center and far idler rolls so that all greasing may be done on one side, and while conveyors are in operation.

Each section of the main conveyor system is driven at a speed of 300 f.p.m. by a 25 hp., 1760 r.p.m., 440-volt, 3-phase, 60-cycle General Electric Type KG splash-proof motor through a Foote Brothers 75 DX helical gear reducer with a ratio of 14.2 to 1. These drives and motors are interchangeable, which makes it possible to maintain only a small

(*Continued on page* 102)

• **Right: the feed end of the conveyor system in the National Cement Company's quarry.**

• **Below: Sectional elevation of the installation in the quarry.**



Specifications, Research, Car Supply Discussed by N.S.G.A. Directors

another ON THE SPOT report

THE mid-year meeting of the board of directors of the National Sand & Gravel Assn. was held on September 20, 1948, at The Broadmoor, Colorado Springs, Colo. In attendance, in results achieved, and in every other way it was one of the most successful meetings ever held by that group. The same was true of the meeting of the National Ready Mixed Concrete Assn. directors on the morning of September 22 and of the joint meeting of the two boards which followed. Both associations are in excellent financial condition and the membership of each is the highest in history. Most of the directors brought their wives, and all took advantage of the opportunities afforded to see the natural scenic wonders abounding in this area. All agreed that these mid-year meetings should henceforth be held at similar resorts. Several possibilities were suggested for the 1949 meeting, including White Sulphur Springs, W. Va., and Asheville, N. C.

President Thomas E. Popplewell presided, assisted by Vincent P. Ahearn, executive secretary, and Stanton Walker, director of engineering, as the business and technical problems of the association were considered. All these items were thoroughly covered, and many important decisions were made. In addition to the usual financial, technical and business reports, such subjects were discussed as: specification problems, needed researches, the association handbook, cost accounting system, car supply, and so on.

The seriousness of the present specification problem with the U. S. Corps of Engineers was emphasized, as well as the fact that this problem could become even more serious if the demand for aggregates should fall below its present record level.

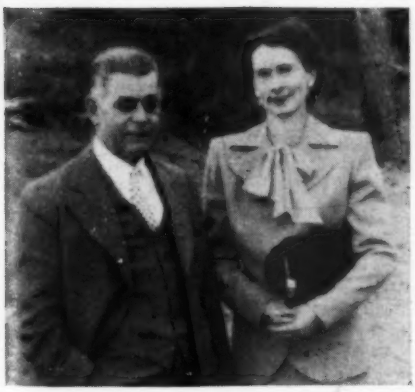
By Walter E. Trauffer

Mr. Walker reviewed the steps leading to the development of the thermal compatibility theory, which holds that in concrete the coarse aggregate and the matrix of cement, fine aggregate and water must have the same coefficient of expansion within very narrow limits. This new specification has made some sands unacceptable for use on government projects. He also mentioned the work the technical committee has done on the matter of alkali reactivity. This has made the use of siliceous sands with calcareous coarse aggregates permissible and is expected to result in more favorable consideration being given to natural sands in the future. There is still some discrimination against gravel and this is being given attention by the committee. Now, said Mr. Walker, a producer will know if his product is acceptable in time to do something about it if it is not approved.

This and other problems, said Mr. Walker, make it advisable for the

• A part of the group at the steak dinner on Cheyenne Mountain, near Colorado Springs, one of the entertainment features of the N.S.G.A. directors' meeting.

• Below: Mrs. Eric Ryberg (Utah Sand & Gravel Products Corp., Salt Lake City), Mrs. Robert Mitchell, Robert Mitchell (Consolidated Rock Products Co., Los Angeles), G. F. Richards, Mrs. Carl R. Olson, and Carl R. Olson (Henry J. Kaiser Co., Oakland, Calif.).



• Mr. and Mrs. E. J. Goes (Koehring Company, Milwaukee, Wis.).

• Stanton Walker (N.S.G.A.), J. W. Murphy (Union Sand & Gravel Co., Spokane, Wash.), D. D. Reynolds (Boston Sand & Gravel Co., Boston, Mass.), Fred E. Bellamy (Concrete Materials Co., Waterloo, Ia.), Mr. and Mrs. W. J. Doyle Jr. (Tulsa Sand Co., Tulsa, Okla.), Glenn Browning (Lehigh Portland Cement Co.), and Mrs. Fred E. Bellamy.

association to expand its research activities as soon as possible; more intensive study of the characteristics of aggregates is particularly important. He said that the construction program at the University of Maryland is now expected to be completed early in 1949 and the association's laboratory will then be moved into its new quarters. He said that some of the old equipment should then be replaced and new equipment added. It was decided to discuss this subject in detail at the annual convention in New York, in February, 1949.

The association's handbook, not yet completed, is expected to be ready in time for the convention. The outline manual on cost accounting which was issued earlier in the year was well received by the membership, but the board supported the committee on its recommendation not to go into a detailed system at this time.

Mr. Ahearn reported that the car supply situation is improving gradually but is still bad in many areas. Conditions may get worse in 1949, he said, due to defense requirements, and shortages may extend into 1950. He recommended that producers at least make an effort to get reimbursement from railroads for cleaning the cars they receive.

In discussing Ex Parte 166 Mr. Ahearn said that the recent freight rate increase has increased the percentage of sand and gravel hauled by truck at the expense of the railroads. The length of truck hauls, he said, is also increasing. He stated that the 3 percent transportation will probably be here for some time and that the increasing amount of truck haulage is intensifying the problem. This subject is being given further study.

Mr. Ahearn gave an advance report on the 1947-48 safety contest in which 68 companies participated. The plant of the Marquette Cement Mfg. Co. at Memphis, Tenn., was the winner in the large plant group. In the small plant group the winner was the silica sand operation of the Pittsburgh Plate Glass Co. at Crystal City, Mo., a non-member company. It was decided at this meeting that future contests would be conducted independently of the U. S. Bureau of Mines, which has been gathering the statistics and determining the winners. There was also some discussion of the program for the coming annual convention.

At the joint meeting of both boards it was decided to hold a 4-day convention in New York in 1949. The National Sand & Gravel Association board will meet on the morning of Monday, February 14, and the N. R. M. C. Assn. board in the afternoon. The combined convention will begin on Tuesday morning, February 15. The locations for succeeding conventions were confirmed —Chicago in 1950, New Orleans in 1951 and Chicago 1952. San Francisco was recommended for 1953.

Mr. Ahearn reported on the wage-and-hour survey made of the industry, and it was decided to bring this information up-to-date four times annually. The joint boards also authorized him to appear for them before Senate and House committees on wages and hours, labor relations, and the transportation tax.

Self-Propelled Earth-movers

(*From page* 98)

screens,, most of these being 5- by 10-ft. units.

Finished sizes are stored in 14 identical cylindrical steel bins, each having a capacity of 250 tons and arranged in two rows of 7 each.

Since the Kerlinger plant began operating in September, 1947, the need for additional fines became apparent, and a Marcy 6- by 10-ft. rod mill has been installed to grind pea gravel into manufactured sand. This mill has a peripheral discharge, feed coming from a pair of 40-ton steel bins, each of which feeds one end of the rod mill. The mill has been producing at the rate of about 20 tons hourly of specification sand with a calculated wear loss of rod of .4 lb. per ton of output.

Electric Power

(*From page* 100)

stock of replacement parts.

Each of the two belt-conveyors in the quarry is driven by a 20 hp., 1750 r.p.m., 220-440-volt, General Electric ball-bearing splash-proof motor. This conveyor from the primary crusher to the secondary crusher is driven at a speed of 150 f.p.m., while the conveyor from the secondary crusher to the surge tank is driven at a speed of 200 f.p.m.

This conveyor system has shown marked saving in the ton-mile cost of haulage and it insures a steady flow of material to the plant.

Forrestal Endorses Plan For Reactivation of U.S.O.

The Civilian Advisory Committee appointed last year by Defense Secretary James Forrestal to make recommendations for the welfare and morale of the enlarged military service personnel recently made public its suggestion that the wartime U.S.O. be reactivated. In pursuance of this recommendation, Secretary Forrestal requested that the nation's Community Chest campaigns throughout the country this fall aid in the support of the new U.S.O. by including it in their 1949 budgets.

The six original organizations which combined to form the wartime agency agreed unanimously to accept the challenge. New U.S.O. services will be based (beginning 1949) upon requests from the Army, Navy and Air Forces. To the more than 400 American publications which have signified their willingness to back the Community Chest effort in behalf of this last-minute appeal from the U.S.O., PIT AND QUARRY adds its endorsement.

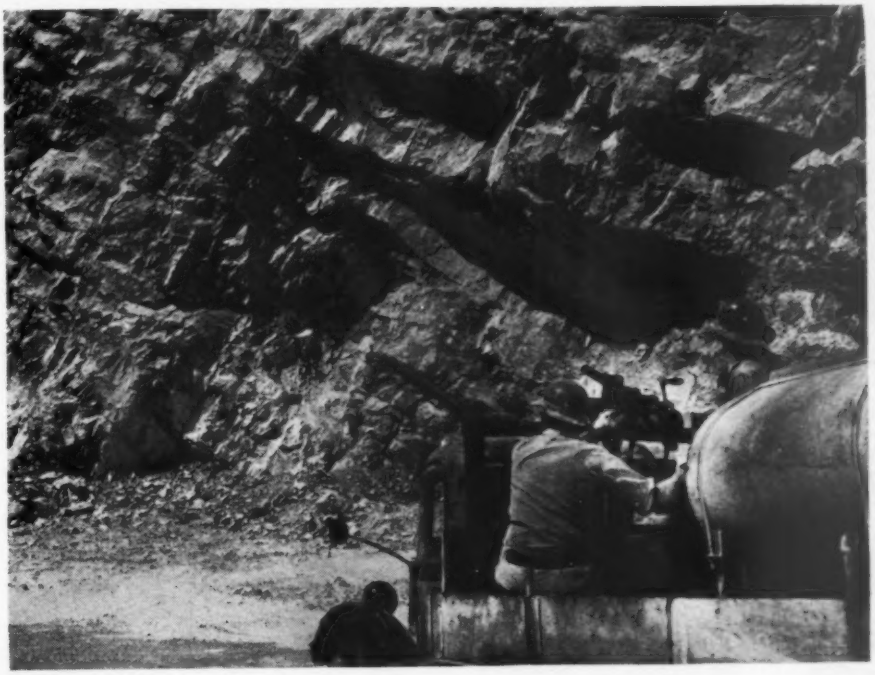
Industrial Gun Used at Nevada Quarry to Dislodge Rocks

THE Apex Nevada quarry of the United States Lime Products Corp. is situated in some of this country's most desolate terrain. At this quarry, as in many others, falling rock constitutes one of the major safety hazards. In an effort to eliminate this hazard and also to cut down the non-productive shovel time, a heavy Remington Industrial gun is used to knock down loose overhanging rock.

This particular industrial gun was originally designed for shooting out clinker rings formed in cement or lime kilns. The 92-lb. gun uses ammunition of approximately 8 gauge and fires a three-ounce slug with a muzzle velocity of 1,600 f.p.s. Horizontal and vertical adjustments are made with a hand crank and hand wheel.

At the Apex quarry, an I-beam gun-mount is attached behind the cab of a 1½-ton stake truck. It takes only a few minutes to set up the gun, which fires over the truck cab (see illustration).

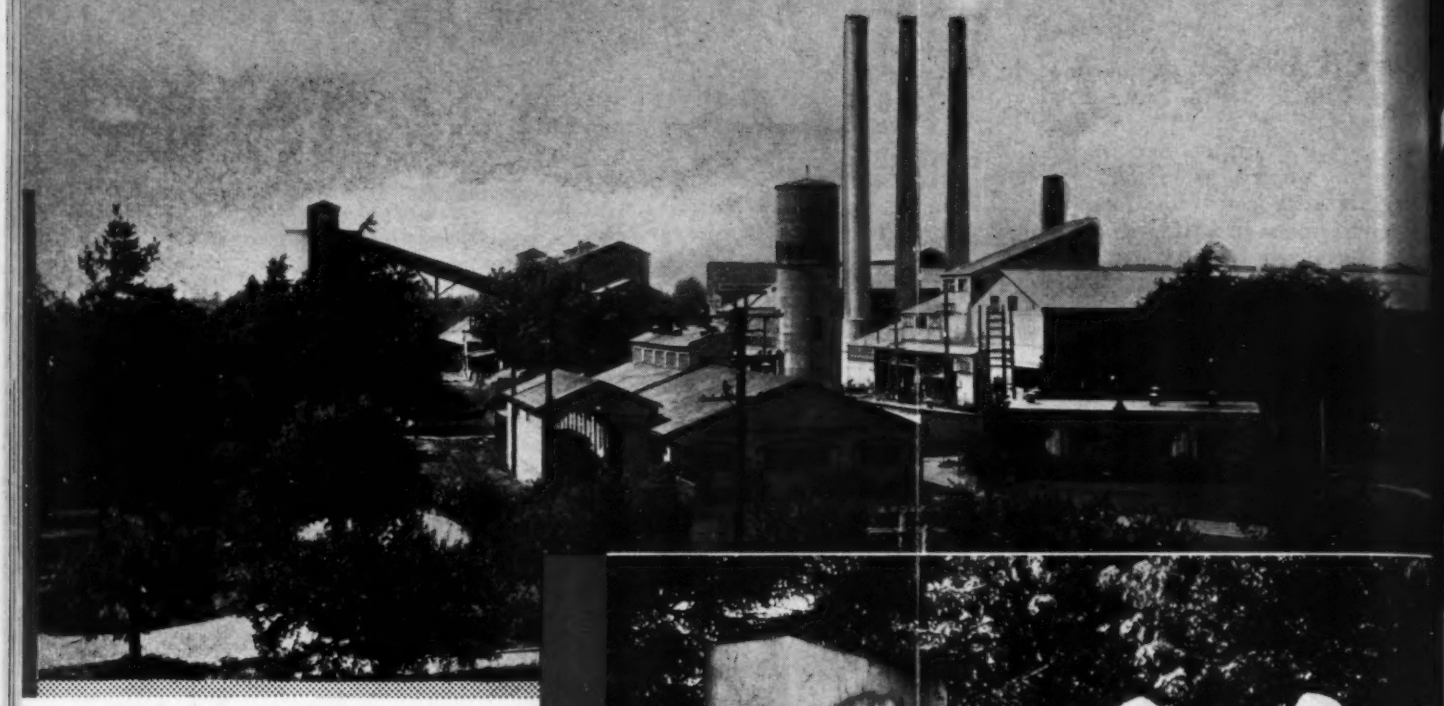
The gun performs two important services: It dislodges overhanging rocks from the quarry face, eliminating much of the dangerous and time-consuming barring down work—always a serious safety hazard; and it dislodges key rocks in muck piles which start slides in the working pile. This neat trick saves many hours of non-productive shovel time which otherwise would be spent to accomplish the same results. All things considered, the company has found the gun a worthwhile investment. A second gun soon will be put into use at the company's Sonora, Calif., mine.



• **Right: The United States Lime Products Corp. uses an industrial gun to dislodge loosely-held overhanging rocks. The gun, as shown in this view, is mounted behind the cab of a 1½-ton stake truck.**

• **Below: An aerial view of the Apex, Nev., plant of the United States Lime Products Corp. The plant is located in one of the country's most desolate areas.**

LONG KILN SHRINKS COSTS



General view of the Olympic plant taken from roof of the oil-storage tank. The new kiln is exhausting through the third of the three old stacks.

H. M. Krabbe, new general superintendent, who succeeded his father, A. F. Krabbe (right). At left is the Portland Cement Assn. safety trophy which the plant has won several times.

By HARRY F. UTLEY

another ON THE SPOT report

INSTALLATION of an 11- by 400-ft. rotary kiln at the wet-process plant of the Olympic Portland Cement Co. at Bellingham, Wash., was completed early this year, the unit having gone into service late in February, 1948. At that time the three old kilns, two of which had seen service since the plant was built in 1912 and the third since 1925, were permanently cut out of production.

While the changeover had little effect on productive capacity, output remaining in the neighborhood of 3,000 bbls. per day, the new equipment, as was anticipated, is showing an economy of better than 25 percent in the cost of fuel burned. At the same time the new kiln is producing a more desirable clinker, plus the numerous advantages which the cement industry has discovered in recent years as the replacement of short kilns with longer units became quite general.

New coolers, dust collectors, and additonal raw-grinding equipment were also included in the program of improvements, and the finish-mill is slated for rehabilitation some time in the future.

When the plant first started operating back in 1913, oil was used to fire the two short kilns. Five years later, pulverized coal was adopted as fuel. This year, when the new 400-ft. kiln went into operation, the company went back to oil, but has provided for the optional use of coal in its burning set-up and, when it becomes necessary, a unit-firing coal mill is to be installed on the firing floor.

A new building was erected to house over the new kiln and dust-collectors. The kiln is an F. L. Smidth all-welded Unax with ten integral Unax cylindrical coolers attached in a single row around the discharge end. For a distance of 191 ft. between the chain section and the burning zone the kiln is insulated with 2 in. of Johns-Manville asbestos fiber. The insulated section is lined with General Refractories "HIAC" and the 65-ft. burning zone with "Arco" (70 percent alumina) brick. At the feed and firing ends, Harbison-Walker "Duro" and "Varnon" fire brick, respectively, make up the lining.

The kiln is mounted on six water-cooled tires, slopes ½ in. to the foot, and is driven by a General Electric 125-hp. d.-c. motor geared to the drive ring, with speed control variable between limits of 26 and 78 r.p.hr. Normal operating speed is

The new 11- by 400-ft. all-welded kiln recently installed in the Bellingham, Wash., plant of the Olympic Portland Cement Co.

Newly Installed Wet Kiln At Olympic Portland Cement Proves Worth In Economy of Operation

65 r.p.hr. An International gasoline engine can keep the kiln turning in case of power failure.

The new kiln building was erected alongside the old, which simplified the slurry-feed and clinker-discharge circuits considerably. A Smidth single-spiral scoop feeder introduces the slurry into the kiln.

Bunker C fuel oil is brought in by 9,000-bbl. barges which tie up at the plant dock on Bellingham Bay. The oil is then pumped to a 20,000-gal. elevated storage tank 3,500 ft. distant from the dock.

During its 35-yr. history, the Olympic plant had operated without benefit of dust collection in the kiln department but, coincident with the installation of the new kiln, the latest Buell van Tongeren system of cyclone dust collections was install to handle the exhaust gases, while additional W. W. Sly flat-bag filters were added to remove mill dust in the finish-grinding department.

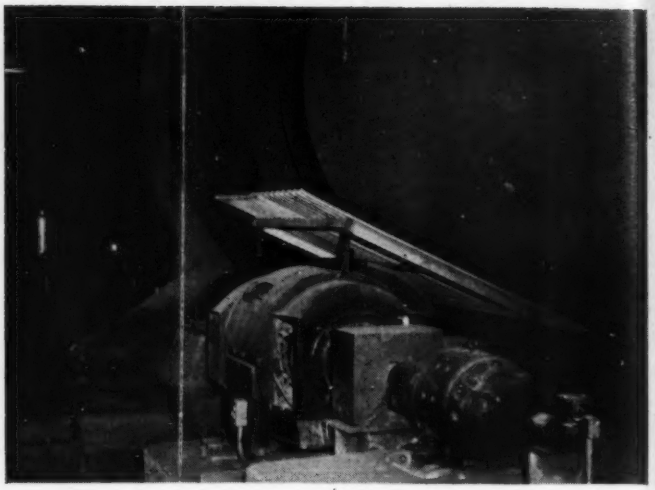
The Buell multiple system on the new kiln was designed to recover 85 percent of the dust and to handle 90,000 c.f.m. of gases at temperatures of 500 deg. F. It consists of two banks of 6 Buell No. 10⅝ A2 cyclones. A Smidth induced - draft fan driven by a G.E. 200-hp. synchronous motor was placed behind the collector, exhausting to one of the three existing stacks which served the old 3-kiln set-up.

The raw-grinding department is being modernized and enlarged with the addition of a Smidth 8½- by 12-ft. ball-mill and a Smidth 8- by 28-ft. tube-mill, the former in closed circuit with Hum-mer screens. The mills will be driven by Electric-Machinery 300-hp. and 700-hp. synchronous motors.

Except for the current program, there have been few changes of basic importance at the Olympic plant during its 35 years of almost continuous operation, a fact which is a tribute to its original F. L. Smidth design and its capable management. Earlier issues of PIT AND QUARRY have described the original plant in considerable detail. When the plant was built in 1912-13, it was reportedly the first wet-process operation on the Pacific slope. The original quarry was at Balfour, Wash., but in 1926 the company purchased a new deposit at Limestone, Wash., 30 miles northeast near the international boundary, and shortly thereafter erected a new crushing plant and aerial tramway there. A locomotive and cars formerly ran from quarry to crusher but, in 1945, this system was abandoned in favor of two Easton TR-13 side-dump quarry semi-trailer units drawn by Mack tractors. Reduction of the stone to minus-¾ in. is done by an Allis-Chalmers 42-in. gyratory crusher

Control board on the burning floor in the new kiln building.

The discharge end of the kiln, showing the burner and the cooling cylinders.



The drive motor and auxiliary equipment on the kiln.

The single-spiral feeder which introduces slurry into the kiln.

and a Symons 7-ft. cone. The stone is carried downhill by tramway for a distance of about ½ mile, where it is loaded into 50-ton hopper-bottom railway cars owned by the cement company. Clay comes from a pit 5 miles to the north. Slag, obtained from smelters in Tacoma, is shipped in by barge.

Raw grinding has been a 3-stage operation over the years, using Kominuters, Cylpeb and tube-mills. This department is being improved by the addition of the new ball- and tube-mill previously mentioned. Slurry is collected in four 2,800-bbl. basins, blended, and sent to the feed tanks at the new kiln, being fed to the kiln feeder by recently-installed Wilfley centrifugal pumps which replaced old plunger pumps in the circuit. The finish mill houses Kominuter, tube, and Unidan mills which were connected to the Sly dust arrestors previously referred to. The entire department is also scheduled for complete modernization.

The original 10-silo cement storage was enlarged 15 years after the plant was built, bringing the total storage capacity in the silos and packing plant to about 150,000 bbls. Four St. Regis 4-tube and two 3-tube packers are presently used to sack that portion of the output (60 to 70 percent) which is not shipped in bulk.

Three types of cement—standard, modified, and high-early-strength—are currently being produced.

A. F. Krabbe, general superintendent since 1913, retired in the summer of 1948 in favor of his son, H. M. Krabbe. Mr. Krabbe is one of the grand old men of the Danish "dynasty" of portland-cement pioneers who are largely responsible for the growth and development of the American portland-cement industry. Now 73 years old, he was connected with the F. L. Smidth organization in Europe before and shortly after the turn of the century. He has been on the operating end in the industry since he came to the United States in 1905, supervising plant operation in mills in the Eastern and Rocky Mountain areas until he took over the management for the Olympic interests at Bellingham in 1913. Since his retirement, he and Mrs. Krabbe have been vacationing in Europe. It was while he directed the F. L. Smidth exhibit at the Paris Exposition in 1900 that Mr. and Mrs. Krabbe were married and their itinerary on the Continent is, of course, including a "second honeymoon" visit to the French capital.

H. M. Krabbe, the new general superintendent at Bellingham, has been closely associated with his father in the management of the plant for the last 15 years as plant engineer and, more recently, as assistant superintendent.

The Olympic Portland Cement Co., Ltd., and its associate organization, Balfour, Guthrie & Co., Ltd., general managers, maintain general offices in the Dexter-Horton Bldg. in Seattle.

N.A.C.E. Reports Membership Of 1400—Five Regional Offices

An exceptional growth of a non-profit technical association to meet a specialized need has been recorded for the National Association of Corrosion Engineers.

Formed in 1944 by a dozen pipeline engineers who wanted to do something about the losses suffered by industry each year through corrosion, the association now numbers more than 1400 active members and 190 company members. Currently the organization has regional headquarters in New York, Chicago, Birmingham, Houston and Los Angeles. Headquarters are at Houston. This year's president is F. L. La Que of The International Nickel Company.

Two Sand-and-Gravel Concerns To Enlarge Towboat Fleets

Dravo Corporation has announced plans for the building of ten additional sand and gravel barges for its Keystone Division. Each barge will be 135 by 27 feet.

The Cumberland River Sand & Gravel Co,. Nashville, Tenn., plans to construct three more towboats as soon as the steel situation eases. The company now operates four boats, the *Jerry, Marjorie, Virginia,* and *Dorothy.*

Danger! Falling Rock!

ACCIDENTS from falling or sliding rock are responsible for at least 10 percent of the total injuries occurring in quarries. That this type of accident also accounts for approximately one-third of all deaths in quarrying makes control over this type of danger doubly important.

In these pages we have reprinted parts from an industrial data sheet prepared by the Cement and Quarry Section, National Safety Council, under the supervision of G. G. Grieve, Council representative for that section. The information contained herein is a compilation of accident experiences from many sources. However, it should not be assumed that the practices recommended include every acceptable procedure in the field, nor should they be confused with American Standard Safety Codes, federal laws, insurance requirements, state laws, rules and regulations, and municipal ordinances.

The recommendations contained in this report, prepared by the National Safety Council, can, if followed, materially reduce the number and severity of accidents in your quarry.

Operating and Blasting

Many accidents from falls or slides of rock have been traced to improper operating or blasting practices. A careful study made by one company disclosed that when a bank was dangerous to men and equipment, invariably a faulty blasting pattern or practice was the cause. The procedures described in the following paragraphs are recommended to eliminate the dangers traceable to faulty blasting practices.

Where materials and equipment permit, the walls of flat-lying deposits are kept vertical. However, vertical walls are not recommended for steeply dipping rock formations.

The single bench method of quarrying is generally recommended for faces up to 125 ft. high. If the multiple bench method is used benches should be at least 10 ft. wide and should be kept free of loose material.

Toeboards may be used to keep rock from falling, and hand rails or cables on the open side are recommended for preventing workers from falling.

• Correct safety practice—the man working at the quarry face is provided with a safety line.

Stripping the overburden to bed the face is sound practice. If the quarry is on a side hill, the minimum distance should be 15 feet. To prevent material from washing or sliding into the quarry, the overburden should be sloped to the angle of repose throughout its length. (See table.)

Angles of Repose	
Clay, dry, natural	45°
Clay, loose	37°
Clay, wet	16°
Sand, dry	37°
Sand, wet	22°
Rock, hard (riprap)	45°
Gravel and clay, loose	37°
Sand and clay, loose	37°

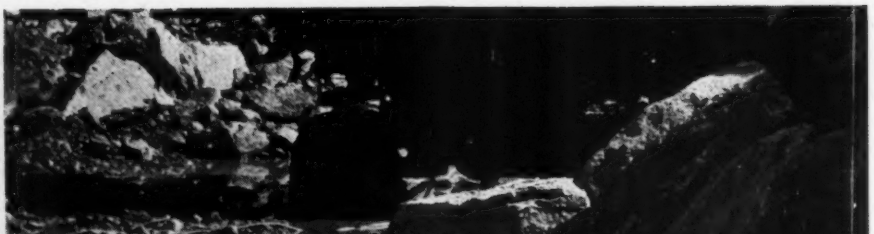
If the quarry is on a steep hillside, a windrow of screenings, baffle boards, screens, or cribbing is necessary to prevent movement of material into the quarry.

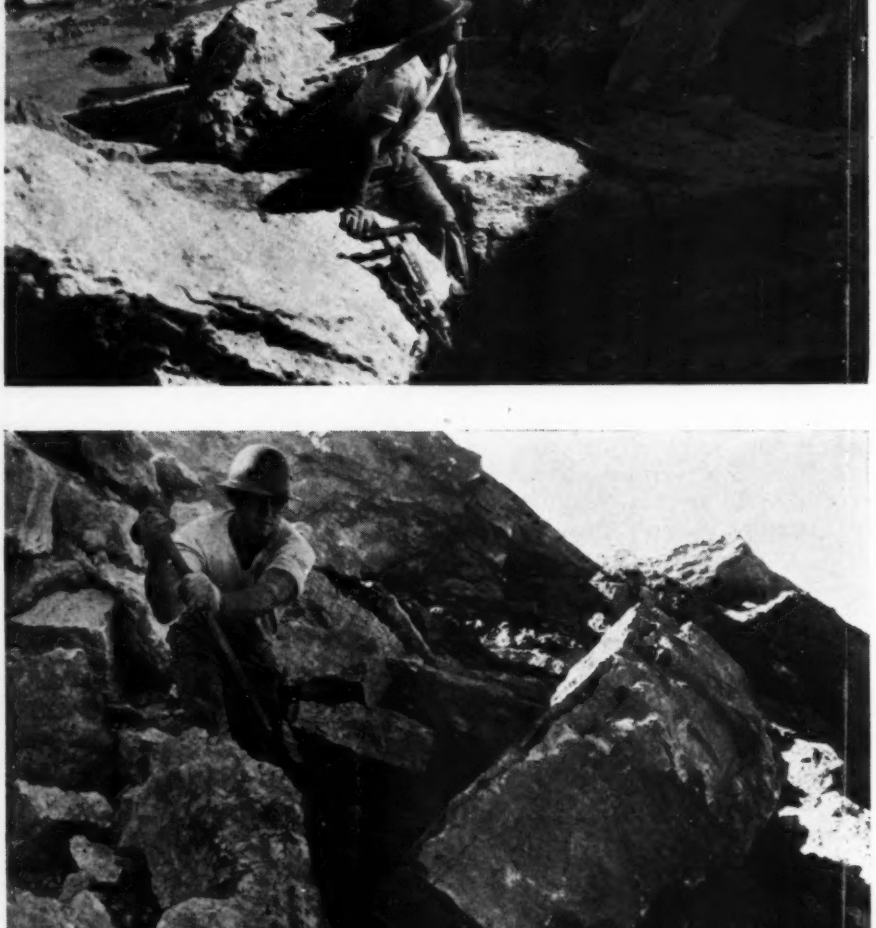
Jackhammer operators are the employees most frequently injured from falling rock. To reduce their exposure to injury, primary blasting practices should be improved by securing maximum fragmentation.

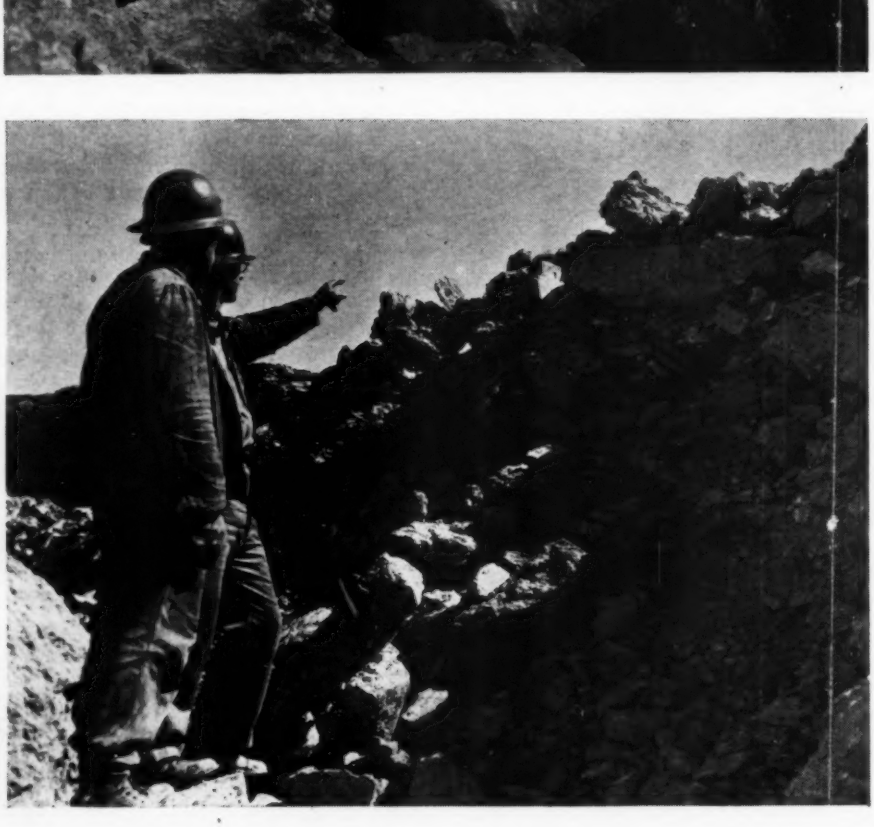
Accidents from slides of hung-up rock often result in serious injuries and sometimes costly damage to shovels. Poorly placed primary drill holes, faulty loading, and other faulty primary blasting practices increase the likelihood of hung-up rock.

In some quarries having high faces, the possibility of a hung-up bank is considerably decreased if the blast is forced out as far as possible and the height of the piles thus

• A power shovel should be used to remove large rocks from the pile or from the quarry face for blasting.







reduced, so that the shovel can handle the broken rock without dangerously undermining the bank.

In some instances it may be necessary to induce a slide to get stone within reach of a shovel. It is very dangerous to climb a hung-up bank to loosen the rock with a bar.

The practice of one quarry is to move the shovel back 30 or 40 feet, place the required amount of dynamite in a crevice near the top of the pile, and explode it. Workmen are ordered back before the shot.

The following method has been suggested for handling large rocks too near the face for safety. When the shovel takes the last cut near the face, it digs under the large rocks, which slide down the bank away from the face where they can be drilled safely. The shovel operates at another point in the bank while the rocks are being drilled and blasted, to save production time.

In quarries operating small shovels, rocks too large to handle and too close to the face to drill may be dug around and left until after the next primary shot. When the broken rock from this shot is removed, the large rocks are a safe distance from the new face.

Some quarrymen have concluded that if banks are limited to from 20 to 25 ft. in height, bank trimming by hand could be almost eliminated. On banks of such heights, a trained operator can do a first-class trimming job, without danger.

If it is necessary to drill large rocks on top of the pile near the face and if the rocks cannot be let down by undermining without endangering the shovel and the operator, the following safeguard has been proposed.

A wide roll of tarpaulin is laid about 10 feet from the edge of the face, secured with flat stones, and then rolled over the rim in line with the rock to be drilled. The tarpaulin must be long enough to reach the rock pile. The operator is then protected because any small stones fall harmlessly behind the tarpaulin.

Regular Inspections

The outstanding cause of injuries from falling or loose rock is failure to inspect the face for loose or hung-up rock. A systematic inspec-

• Top: The face or the pile should always be inspected before any work involving exposure to loose rock is performed.

• Center: Rock should be barred down only from above or from the side.

• Bottom: A good foreman keeps his men constantly aware of the danger from falling rock.

tion procedure established by the management is therefore recommended. A periodic inspection should be made an unvarying part of the working routine and should be strictly adhered to by foremen and men.

Although the great majority of accidents occur at working faces, workers are occasionally injured on travelways for persons and trucks near faces or benches. These locations should be inspected at least once every 30 days and necessary precautions, such as removal of loose rock, should be taken.

Unworked faces which are not inspected regularly should be fenced or barricaded or posted with conspicuously placed danger signs.

It is essential to assign the inspections to a foreman or to a trained and experienced employee and to require a written report with recommendations. Management's failure to delegate responsibility for inspections is a factor in numerous accidents.

At working faces the foreman should make inspections at the following times: at the beginning of each shift; after blasting; after freezing and thawing weather; and after heavy rains.

In addition, each employee should thoroughly inspect the face before he performs any duty involving exposure to the danger of falling or sliding rock. It is essential for both new and experienced employees to realize the dangers and to recognize unsafe conditions.

Numerous accidents occur to men who have worked in quarries for many years. They have not been trained and required to inspect the face before starting any type of job. Furthermore, they may fail to realize that conditions may be changed during the shift because of the removal of rock, because of secondary blasting, or by the weather. Many do not observe the area above them periodically while working.

Another point overlooked is that in some rock formations fissures or cracks extend back from the face and create an unusual danger. Even though drill men should inspect for and report dangerous conditions, continuous watchfulness by men at the floor is still essential.

The standard procedure of inspecting and scaling after blasting and after rain or freezing and thawing weather should be directed and checked at all times by the quarry foreman.

In some quarries the foreman and bar men thoroughly examine the face from the quarry floor before scaling is started in order to determine the safest and most efficient procedure for taking down loose material.

Safety Equipment

Workmen should not be allowed to scale or do other work on a face without using a safety belt and/or a line. A ¾-inch manila rope attached to a ring at the back of the belt can be used. The rope should be long enough to reach to the quarry floor.

The other end of the rope is secured to a steel rod at the top of the face, placed in a drill hole approximately three feet deep and at least ten feet back from the face. A 1-in. rod with a tree-head not less than ⅝-in. by 12-in. welded to the top has been found satisfactory.

One member of the Council attaches a bar man's life line to a steel cable which extends over the edge of the face to the anchorage. Loops not less than 4 inches in diameter are secured at each end of the cable with two U-bolt clamps.

Persons required to use safety belts and life lines should inspect them before each use. If fiber ropes show abrasion, broken fibers, cuts, fraying, or other defects, they should be promptly removed from service.

All quarry employees should wear safety shoes. Hard hats should be worn on most quarry jobs.

Barring Down the Face

A reliable man should be assigned to watch and direct the employee working on the face, to keep the line taut and snubbed about the rods, to guide the rope, and otherwise to assist the man below. Unless relieved by another worker, the top man should not leave his post while the bar man is working on the face.

If equipment is required, it should be lowered to the working place first and then the man should follow it down.

All employees on the quarry floor should be in the clear before the bar man begins to work on the face. In some instances it may be necessary to rope off, barricade, or guard the floor below the section of the face to be scaled.

A good practice is to move the shovel and other equipment back a safe distance before barring down operations are begun, especially if the operator may be exposed to the danger of a falling or rolling rock while he is engaged in oiling, inspecting, or making repairs.

In performing some types of work it is dangerous for one employee to work under another.

The safe procedure for a bar man is to work from the top down and to descend below an area only after it has been thoroughly tested foot by foot and all loose rock has been dislodged. The safe place to stand in barring down is above or to one side of the rock. Violations of this precaution have resulted in many injuries.

A bar man may also be struck by a rock dislodged by the safety line unless he works to one side of the line. The man at the top can help prevent this possibility by guiding the rope.

Numerous accidents are due to failure to inspect the bar down thoroughly. The foreman should constantly inspect the work while it is in progress and view the face from various angles to detect any rock which should be taken down. No overhanging material should be left, even if it is necessary to blast it down.

When a bar man has completed his work on the face, he should not remove his safety belt until he has reached safe ground, at least 10 feet back from the edge of the wall.

Summary

To prevent accidents from falling or sliding rock, management and supervision should direct particular attention to the following factors:

a. Making improvements in blasting practices to increase fragmentation and reduce the amount of secondary drilling and blasting and, consequently, exposure to the hazard entailed by this work.
b. Making sure that primary blast holes are drilled and loaded in such a way as to reduce hang-ups and slides of rock.
c. Devising ways of utilizing the shovel to remove large rocks from the face for safety in drilling.
d. Establishing a routine procedure for inspecting the face at the beginning of the shift, after blasting, and after heavy rains or freezing and thawing weather conditions.
e. Training employees to inspect the face thoroughly as the first step in starting a job involving exposure to falling rocks.
f. Providing workmen with hard hats and safety shoes, and promoting the use of this safety equipment.
g. Training employees to understand the hazards of their work and to follow safe practices.

the plant operator

PIT AND QUARRY

by WOLF G. BAUER
Consulting Engineer

DRYING PROBLEMS IN THE LIME AND ALLIED MINERALS INDUSTRIES
PART V. ROTARY DRYER HOODS AND SEALS

another P and Q exclusive

Whereas in the preceding chapter the structural elements of the rotary dryer were brought into focus, the various connections and appurtenance to the dryer itself are to be discussed next. Irrespective of the rotary dryer design, or drying technique employed with such dryers, certain basic components make up the complete system. Hoods and seals compose the first link between cylinder and the gas and material flow.

Breeching Hoods or breechings are placed on each end of the drying cylinder to receive gases and solids. The cylinder ends are made to project slightly into these hoods through rubbing gas seals.

Hoods take many forms and sizes, depending in part on the requirements at each end, and in part on the designer's preference. In its simplest form, the feed-end hood of a counterflow rotary dryer may be a short steel cylinder of larger diameter than the dryer, incorporating the following: a seal; gas duct connections to dryer, fan, cyclone, or stack; a feed pipe or feeder projecting through it into the cylinder; a supporting frame (stationary or movable); inspection and clean-out doors; draft and temperature control elements; and any possible gas and air-locks for incoming or outgoing material. If the dryer is equipped with a central hot gas duct, the seal between the rotating gas duct connecting with the stationary hot gas intake, is best kept inside the hood or breeching, so that not more than one seal will be required.

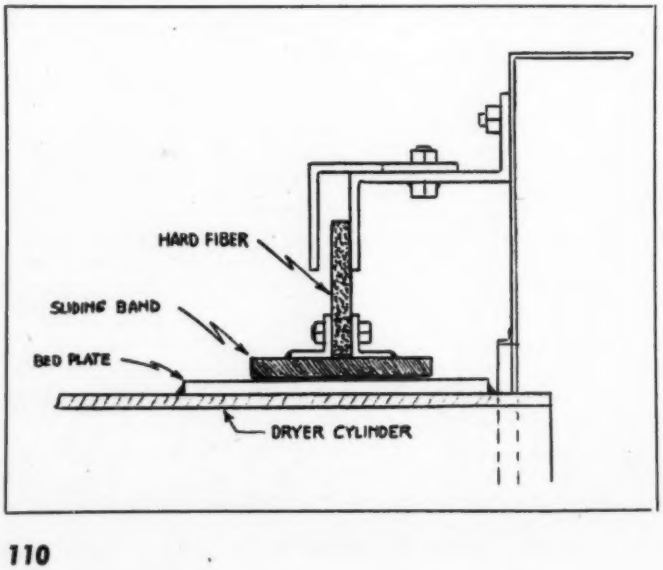
The hood or breeching at the material discharge end may be constructed in a manner similar to the feed-end breeching. Generally the upper half is circular, the lower half having attached a hopper-type bottom to receive the dried material.

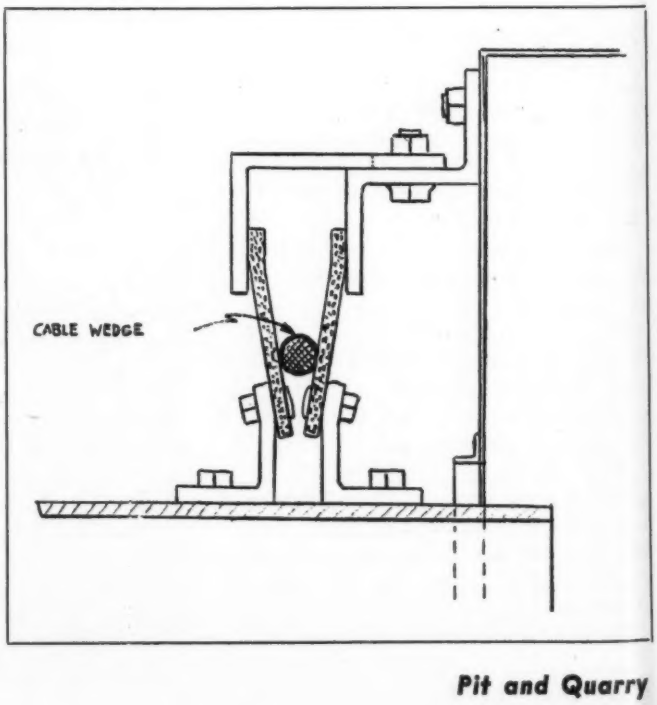
With high-temperature counterflow systems, this breeching is refractory lined, and is directly connected to the hot gas source or combustion chamber. Special air-locks may be provided, especially if the hot discharged material passes to an attached cooler being operated under suction.

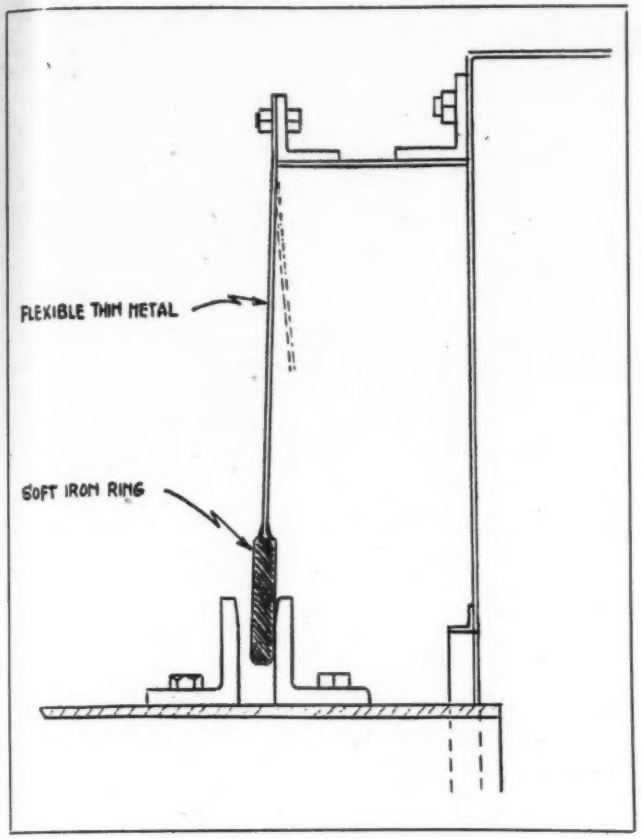
Breechings need not be large, but they should be carefully built; entry and inspection doors must fit tight, but operate quickly. Brickwork should be well-keyed and supported, and laid in a high-strength sodium silicate-clay cement to resist alternate heating and cooling, especially

• Right: Fig. 2. Double contact fiber seal.

• Below: Fig. 1. Floating ring seal.







• Fig. 3. Elastic diaphragm seal.

when an operation of less than 24 hours is maintained.

Under certain conditions, especially when the discharge end represents the integral rotary cooler section, the rotary cylinder-end may take the form of a rotary screen through perforations or a wire mesh section. In such cases, the hood has a split discharge for two sizes. The oversize may represent lumps needing further breakage or drying, or it may consist of the impurities often found in sand drying practice.

Scrapers or plows may become necessary at the feed end of the dryer when the incoming material is plastic and sticky. True-turning cylinders are paramount. Slight irregularities may be compensated for by hinging the scrapers so that they can lift on contact. The hood, in these instances, is reinforced to take the extra strain of the overhung scraper frame projecting into the cylinder end.

Gas Seals Several types of seals are common, their design being dictated by such factors as temperature at the scaling point, degree of gas tightness desired, and maintenance conditions. Where sealing conditions are rather severe, it may sometimes be possible to maintain a neutral or atmospheric gas pressure at these points. When seal diameter is large, height differential causes positive gas pressure at the top and negative pressure at the bottom, due to stack effect.

Generally (often for dust nuisance alone), dryers are operated under negative pressure. In such cases, the primary function of the seal is one of minimizing the entry of cool air, which may be detrimental to process conditions by unduly lowering drying-gas temperatures or by increasing fan power demands. The economic balance is therefore one which weighs higher construction and maintenance cost (of the seal) against advantages in process control and lower power demands.

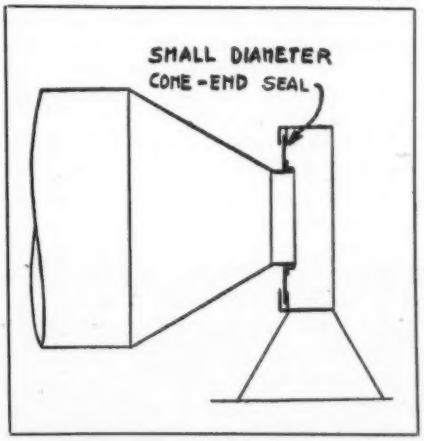
Rubbing contact of the seals is generally between fiber and fiber, or between fiber and metal surfaces. Under higher temperature conditions, metal-to-metal contact is satisfactory. In the latter case, a soft replaceable iron liner or ring is used to wear against a machined hard metal surface. In the case of fiber compositions, a metal-filled hard fiber such as is used in clutch or brake-band facings may be employed.

Seal Alignment Longitudinal self-alignment can be provided by a "floating" strap or band around the dryer cylinder, the latter being in position to slide-roll back and forth along the cylinder as pressure of the seal rings, due to heat expansion or roller alignment variation of the shell, forces the band to align itself to the rubbing seal ring. (Figure 1) Lateral movement is also achieved by the "give" and bending of fiber rings pressing against metal or fiber-lined seal rings. Figure 2 shows how positive contact is maintained through the use of a double-contact fiber ring seal. This type is adaptable for short and low-temperature cylinders having little lateral movement. This seal can also be mounted on a floating rim or band. Such bands do allow a slight amount of gas leakage to occur between band and shell, but the friction loss for the usual draft conditions is so high as to hold gas movement through the gap to a minimum.

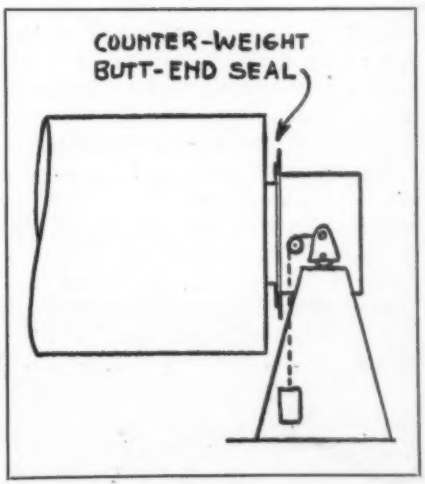
Longitudinal self-adjustment can be obtained through the springiness of a light-gauge metal diaphragm below the elastic limit. Large-radius diaphragm plates are essential to minimize metal fatigue. Figure 3 shows such a diaphragm seal with a metal rubbing ring. This type is well suited to high temperatures, where contact need not make an absolutely tight seal.

For butt-end type seals as shown in Figure 4-B, longitudinal movement of the cylinder is absorbed by mounting or pivoting the hood section of the seal on a movable base. Positive pressure can then be applied to the contacting surfaces of the seal by the use of compression springs or a counterweight. (Figure 4-B) Solid material and gas passage connections are then to be made flexible. It is, of course, true that extra power is required in turning the cylinder against positive pressure friction seals; however, purity of collected gases in the low-temperature drying-volatizing processes may justify this arrangement.

(*Continued on page* 123)



• Fig. 4A



• Fig. 4B

Casualty Losses Are Deductible

MANY taxpayers continue to overlook deducting losses sustained by destruction of property by fire, storm, flood or other casualty. This is especially true when the damage is only partial, and when it is repaired and forgotten by the time the annual income tax return is made. Yet such a loss is as real and substantial as though a safe cracker had stolen a like amount from the strong box. Even more commonly overlooked than damage to business property is that to non-business and other property.

By HAROLD J. ASHE
Tax Counselor

Pointing this up is the recent disastrous flood in the Northwest. Only a fraction of the losses caused by the flood will be reflected in 1948 income tax returns by taxpayers. Less spectacularly, millions of taxpayers suffer casualties every year, ranging from flooded basements, destruction of trees and plantings by storm, to complete demolition of large business structures by hurricanes, fires and explosions.

It is unwise for the taxpayer who has suffered a casualty loss to trust to memory in getting such a loss into his annual tax return. Moreover, such a slipshod approach, even if the loss is entered in the tax return, may lay the deduction open to question by the Internal Revenue Bureau, and may result in its possible disallowance.

Immediately a loss has been sustained, the taxpayer should start building a record to substantiate the amount of the loss. Particularly where the loss is only partial and therefore subject to dispute, it is advisable to have an appraisal of the loss made before the damage is repaired. Secondly, the taxpayer should make a point of keeping repair bills against future challenge.

The general rule applying to deduction where the destruction is complete is that the amount of the deduction shall equal the adjusted basis of the value of the property—that is, the original cost less depreciation since acquisition, and to date of loss.

However, where the loss is only partial, the deduction shall be the *value* of the property immediately prior to the loss, less that *value* of the property immediately after the loss. This loss must not exceed the adjusted value.

In both partial and total loss, compensation from insurance must be deducted from the loss to arrive at the unrecovered loss, and the unrecovered loss is the amount deductible in the tax return.

As an example, take the case of a business building damaged by flood. Here is how the loss is reckoned for tax purposes:

Cost of building in 1936	$25,000
Depreciation to date of loss	9,000
Maximum deduction	$16,000
Value before the flood	$15,000
Value after flood	11,000
Flood loss	$ 4,000
Insurance received	3,250
Unrecovered loss	$ 750

As the unrecovered loss is less than the basis (third item), the taxpayer's deduction is $750, the unrecovered loss.

It should be noted that, while a taxpayer may also deduct for non-business property losses, he may do so only if he uses the long form in which he reports such losses, together with other personal deductions. If he uses the short form or takes the standard deduction for personal deductions he may not additionally deduct for non-business property losses. This circumstance emphasizes the necessity for carefully reviewing the year's casualty losses of a non-business character. Frequently such losses will warrant a taxpayer's electing to report his personal deductions instead of using the short form or taking the standard deduction.

A partial check list of deductible casualties includes the following: (a) fire, including damage to business, home, garage, furniture, automobile, equipment, and other property; (b) storm, including damage by rain, flood, lightning, wind, to property; (c) earthquake, damage to property; (e) automobiles accidents, damage to property; (f) theft of property, personal or business.

Sand-Lime Brick Production In Canada Shows Decided Gain

In 1946 five Canadian plants produced 39,096,000 sand-lime bricks, valued at $572,008, as compared with 15,514,000, valued at $260,136 the previous year. Three of these plants are located in Ontario, one in Quebec, and one in Manitoba.

An average of 134 persons were employed in these works during the year and they were paid $236,566 in salaries and wages. Expenditures for fuel and electricity amounted to $47,651; for processing materials, $211,920.

Ryerson Holds Open House At New California Plant

Joseph T. Ryerson & Son, Inc., one of the country's largest distributors of steel from stock, recently staged an open house at its new plant in Emeryville, Calif., in celebration of the opening of this thirteenth unit in a nation-wide group of steel-service plants.

Construction of the Emeryville plant was started in 1947. Including the two-story office building, which forms an integral part of the warehouse structure, the plant occupies about 170,000 square feet of floor space. It is fully equipped with saws, shears, flame cutting machines, and all materials-handling equipment required for quick, orderly movement and shipment of bars, plates, shapes, sheets, tubing and other steels from stock.

Among officials of the company on hand to welcome guests were Everett D. Graff, president, Robert C. Ross, vice-president in charge of operation, and Harold B. Ressler, vice-president in charge of sales, all from Chicago. Wayne D. Dukette, manager of the plant, was in charge of arrangements for the party and played the role of host.

B. F. Goodrich to Build Plant For Manufacture of Belting

A multi-million-dollar plant for the manufacture of industrial rubber belting will be built in Akron by The B. F. Goodrich Company. Four factory buildings will be razed to permit construction of the new plant.

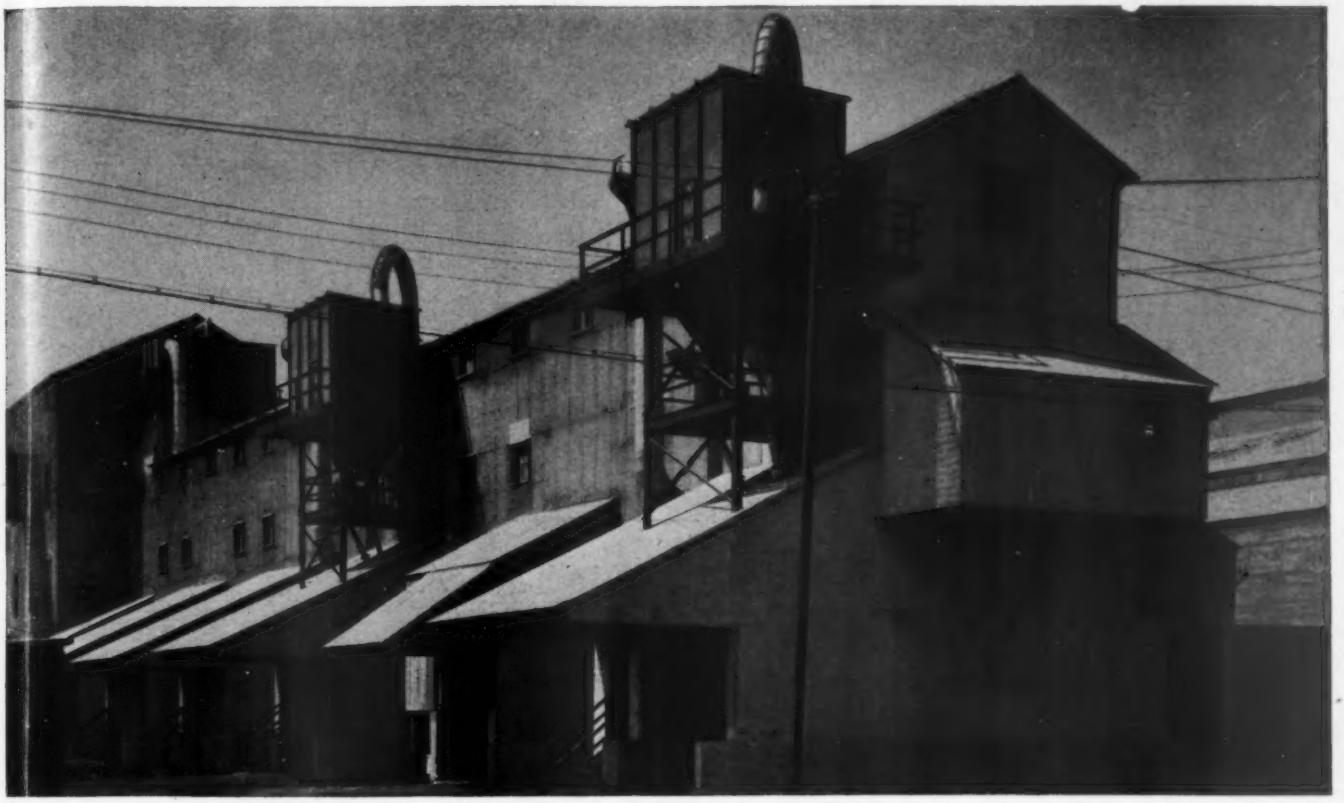
The new buildings will contain 150,000 square feet of floor space. Because of the unusual height and heavy construction, more than 2,000 tons of structural steel will be needed and the building will house equipment especially designed for the manufacture of various types of belting.

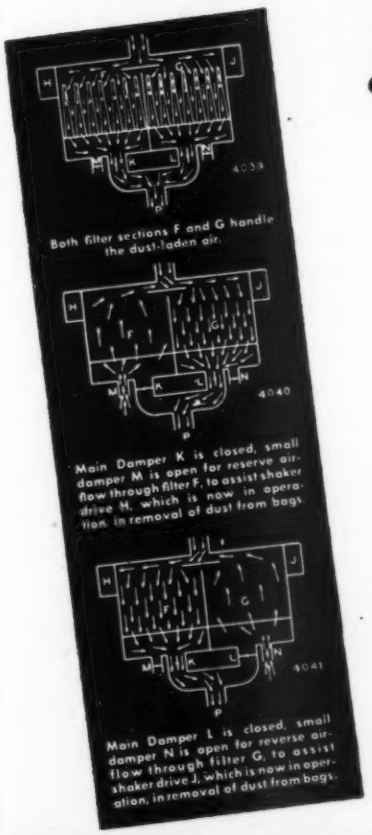
Warner Company Adds 7 Barges To Its Sand-and-Gravel Fleet

The Warner Company, Philadelphia, largest producer of sand and gravel in Pennsylvania, has increased from 5 to 12 the number of welded-steel barges it has on order from Dravo Corporation.

The 130-ft. by 34-ft. craft will be used to transport sand and gravel in the Philadelphia area. They will be preassembled in Pittsburgh and launched at Dravo's Wilmington shipyard.

Three Sly Dust Filters Exhausting Packing Machines and Conveyors in a large Cement Plant. This firm has a number of other Sly Dust Filters.




4039
Both filter sections F and G handle the dust-laden air.
4040
Main Damper K is closed, small damper M is open for reserve air-flow through filter F, to assist shaker drive H, which is now in operation, in removal of dust from bags.
4041
Main Damper L is closed, small damper N is open for reverse air-flow through filter G, to assist shaker drive J, which is now in operation, in removal of dust from bags.

SLY DUST CONTROL

PROVIDES AUTOMATIC CONTINUOUS OPERATION

● In some industrial processes dust control must be continuous —without interruption.

Sly Dust Control Systems provide this feature, when desired, *in addition* to their regular automatic control which eliminates the human element. Details are shown in diagrams at the left.

Sly Dust Filters offer you the following *exclusive* features:

1. Greater filtering capacity because of more filtering cloth
2. Taut bags (patented) save power and improve dust removal
3. Bags more easily replaced
4. Automatic control (any degree) minimizes or entirely removes the human factor
5. Simpler shaker mechanism results in savings in maintenance and operation

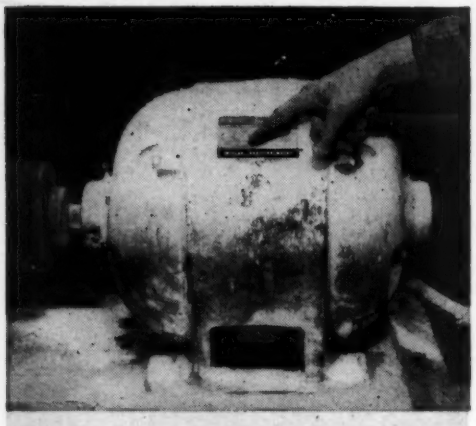
Sly's long experience is at your disposal. Ask for Bulletin 98 and tell us about your dust problem so that we may write you fully.

IN THE CEMENT INDUSTRY, IT'S SLY 4 TO 1

THE W. W. SLY MANUFACTURING CO.

4745 TRAIN AVENUE • CLEVELAND 2, OHIO

Representatives in New York • Chicago • Philadelphia • Detroit • St. Louis
Toronto • Minneapolis • Cincinnati • Rochester • Los Angeles • Birmingham



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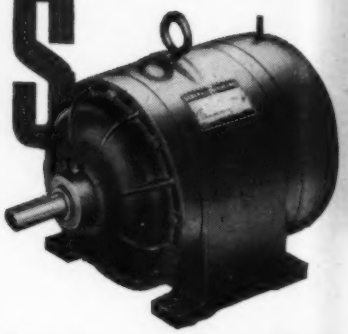
- A cast-iron, double-wall frame which completely encloses and protects the windings and punchings.
- A nonshrinking compound around motor leads which protects motor interior from dust and moisture.
- A rotating labyrinth seal which further protects the motor interior from damage by foreign matter.

TRI/CLAD
REG. U.S. PAT. OFF.
MOTORS

ON 1,220,000 MOTORS



TRI/CLAD

THE SYMBOL OF

EXTRA PROTECTION

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Today, with the "family" including dripproof motors, vertical motors, gear-motors, capacitor-motors, and totally enclosed motors, Tri-Clad motor is, more than ever, the motor that means basic protection, dependable performance, and minimum upkeep. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

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Windings of Formex* wire together with improved insulating materials, reduce the chances of electrical failure. Heat is dissipated quickly — motor stays young for years and years.

EXTRA PROTECTION... AGAINST OPERATING WEAR AND TEAR!

Bearing design affords longer life, greater capacity, improved lubrication features. Bearing seals retain lubricant, keep out dirt. One-piece, cast-aluminum rotor is practically indestructible.

*Trade-mark reg. U. S. Pat. Off.

GENERAL ELECTRIC

750-208C

new machinery and supplies

PIT AND QUARRY

The Winch-Lift trailer will unload at any angle up to the full jackknife position, making this versatile hauler ideal for spot dumping. A simple block-and-tackle system operated by a power winch draws the rear carriage forward; the pivot arms automatically raise it to the dumping position. The Winch-Lift is manufactured in four sizes. Winch-Lift, Inc., 317 First National Bank Building, Shreveport, La.

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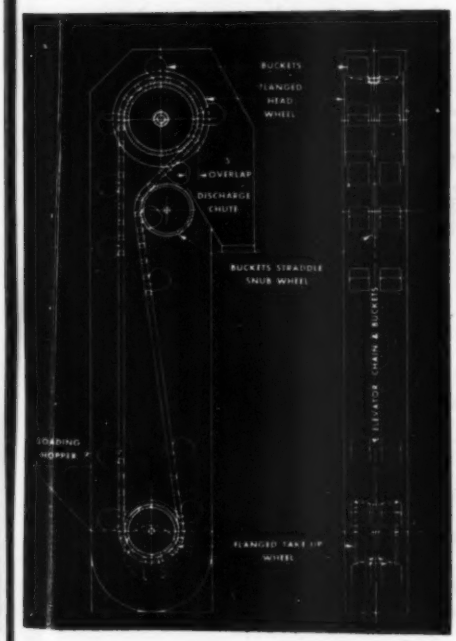

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The discharge and the flanged type head wheel of this bucket elevator permit the handling of hot, light, fluffy, fine, course, abrasive, fragile or sticky materials without maintaining any particular ratio between the bucket speed and bucket spacing. Beaumont Birch Co., 1505 Race St., Philadelphia.

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To fortify the tool against excessive wear, it is supplied with a tungsten carbide inlaid insert. The maker claims that the Whirli Bit can drill hundreds of holes without replacement or re-dressing.

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Sterling hoists, manufactured by the Sterling Machinery Corp., 401 Southwest Blvd., Kansas City, Mo., are offered in two styles—Type A and the lighter Type C. The manufacturer cites the following features: positive springless clutch; self-energizing brakes with Johns-Manville asbestos lining; large-diameter thrust screw encircling the shaft; Timken roller thrust bearings; bearing caps set in recesses in the main frames; side frames of semi-steel, jig-machined for interchangeability; tubular cross members; positive gear drive; power units by Waukesha, LeRoi, Wisconsin, Hercules and Buda.

● Industrial Power Units

K. R. Wilson, 215 Main Street, Buffalo 3, N. Y., offers industrial power units designed to effect substantial saving in power costs. Each unit is driven by a Ford 100-hp. V-8 truck engine, which means that Ford service is available to the user, who also has access to the parts exchange plan.

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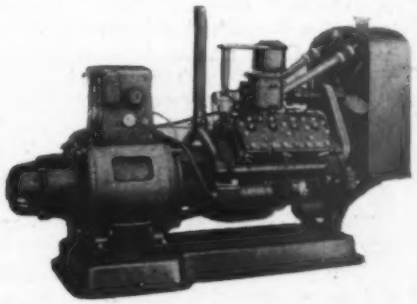

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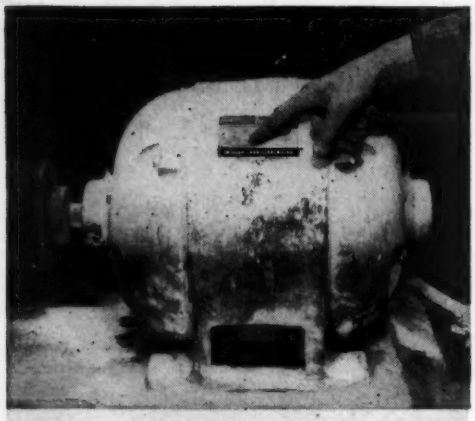

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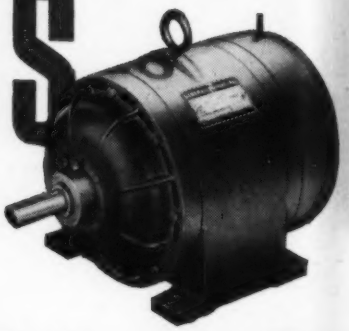

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750-286C

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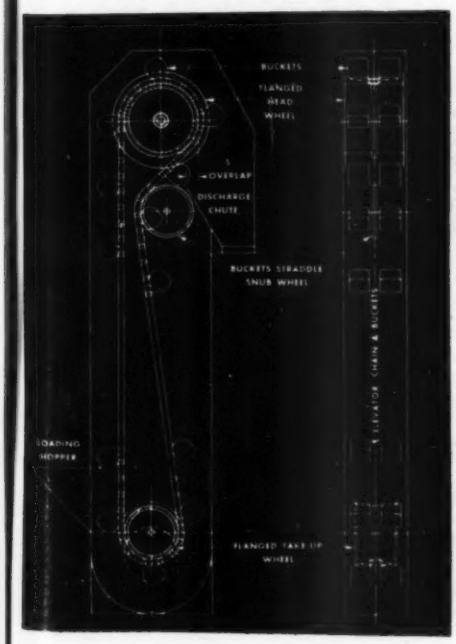

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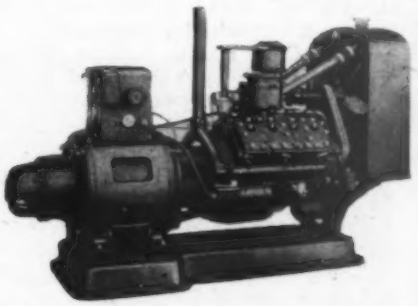

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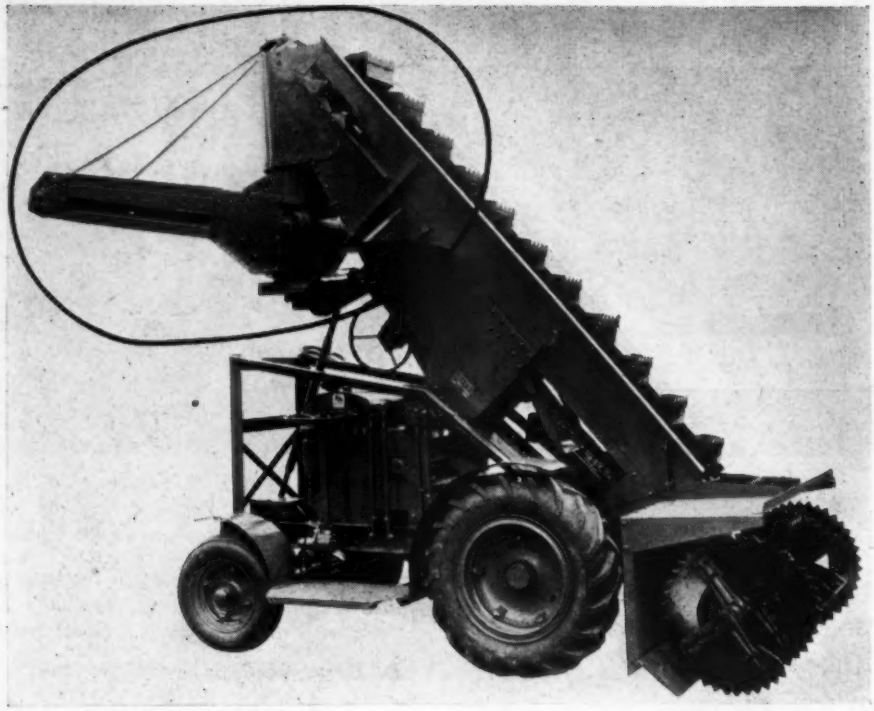


● New Bucket Loader

A new bucket loader with a shorter base dimension to improve maneuverability, and with elevator and discharge mechanisms engineered for alongside truck loading and minimum headroom requirements has been announced by N. P. Nelson Iron Works, Inc., 822 Bloomfield Ave., Clifton, N. J.

Employing the Nelson principle of "picking before shoveling," the new Model K5-B is equipped with renewable steel-toothed feeder blades that loosen the material and assure full loading for every bucket, every trip. Rated capacity of the loader is 2 cu. yds. per minute. ute.

A pivoted discharge equipped with a belt conveyor loads trucks as they pass alongside. The angle of discharge is controlled from the operator's platform. The discharge conveyor can be locked in any position in its 180-deg. arc of operation.

The manufacturer points out that compactness gives the Nelson K5-B definite operating advantages when working in crowded areas where a short turning radius is essential.

● Two New Earthmoving Units

Caterpillar Tractor Co., Peoria, Ill., broadcast its advent into the field of two-wheel self-propelled scraper production with its presentation at the Road Show of the new "Caterpillar" diesel DW21 wheel-type tractor equipped with the new No. 21 scraper.

The unit was one of two new earthmoving combinations exhibited by Caterpillar at the show, the other being the "Caterpillar" diesel DW20 wheel-type tractor, a four-wheel prime mover.

Each of the tractors has the "Caterpillar" constant mesh spur and helical gear transmission (pump lubricated) and a 16-in.-diameter double plate clutch with semi-metallic friction surfaces (foot operated). Each has full floating 4½-in.-diameter rear axle.

The two-wheel DW21 has five forward travel speeds, ranging from 2.6 m.p.h. in first gear to 20.6 m.p.h. in fifth gear, and one reverse of 2.9 m.p.h.

The DW21-No. 21 combination has an overall length of 39 ft., 7 in.; width, 11 ft., 6 in.; height, 10 ft., 8 in.; and wheelbase, 24 ft. The wheel tread is 84 inches. Bar tread tires interchangeable between the tractor and the scraper are 24:00x29, 24-ply.

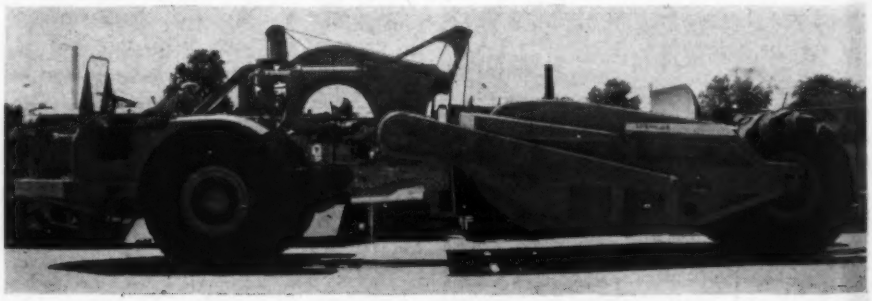
The No. 21 scraper has a struck capacity of 14.5 cu. yds., a heaped capacity of 18½ cu. yds. and a 9-ft., 6-in. cut. It is cable controlled. Brakes on the scraper and tractor, foot controlled and air operated, are coordinated, and provision is made for applying tractor driving wheel brakes individually.

Positive hydraulic follow-up type steering, 90 degrees each way, is provided. A non-stop turn can be effected in 35 ft. The unit has a turning radius of 28 ft. Shipping weight of the combination is 47,220 lbs. The DW21 is equipped with a bucket-type seat, spring-mounted with shock absorber, adjustable forward and back.

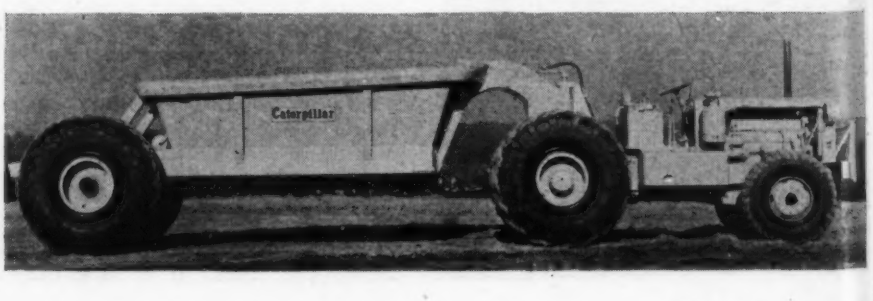
The DW20 tractor also has five forward and one reverse travel speeds—3.26 m.p.h. in first forward speed up to 26.0 in fifth speed; reverse speed is 3.6 m.p.h.

This four-wheel prime mover has a wheelbase of 127 inches; front tread, 88 inches; and rear tread, 84 inches.

The "20" bottom-dump wagon has a struck capacity of 14.0 cu. yds., heaped capacity of 22 cu. yds. The door is hydraulically controlled, with positive mechanical lock.

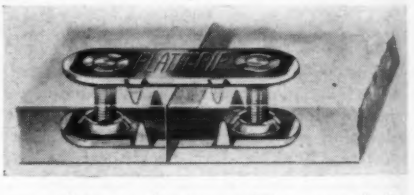


Above: The DW21; below: the DW20.



● Plate-Type Belt Fasteners

The Armstrong-Bray and Co., 5364-76 Northwest Highway, Chicago, manufacturers of belt maintenance products, have introduced a new line of fasteners and repair plates for heavy-duty conveyor belts. These "Plategrip" fasteners are made in six sizes which accommodate all belts from ¼ in. to 1½ in. in thickness. They come in sets consisting of a



top plate, a bottom plate, two bolts, two nuts, and a bolt holding clip.

The fasteners are so formed that the ends of each pair of plates clamp and compress the belting in a wide radial area around the bolt, cushioning the direct pull on the bolt hole and spreading the tension uniformly across the belt.

● Oil Clarifier

Of interest to fleet operators who have acquired vehicles equipped with the military standard oil filter is the replacement oil clarifier unit produced by

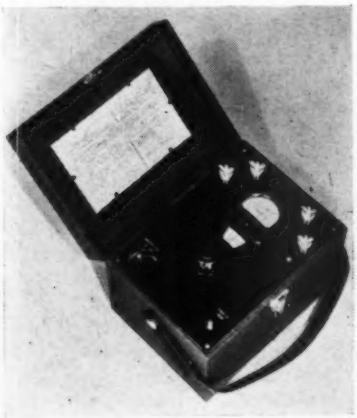
W. G. B. Oil Clarifier, Inc., Kingston, N. Y. The unit, designated as "Model TRU-7", can be installed with a minimum of time and labor on the standard military oil filter base, using the regular T-108 W. G. B. replaceable filter cartridge.

This cartridge, which can be changed without tools, is made from a specially processed fine cotton, which under intensive laboratory and road tests has reportedly proved itself a very efficient filtering medium for all kinds of oil.

● Prospecting Instrument

"Vibroground" Model 258, a geophysical prospecting instrument designed by Associated Research, Inc., 231 South Green Street, Chicago 7, Ill., provides an easy-to-operate method of locating sand, gravel and similar materials, as well as a variety of other minerals.

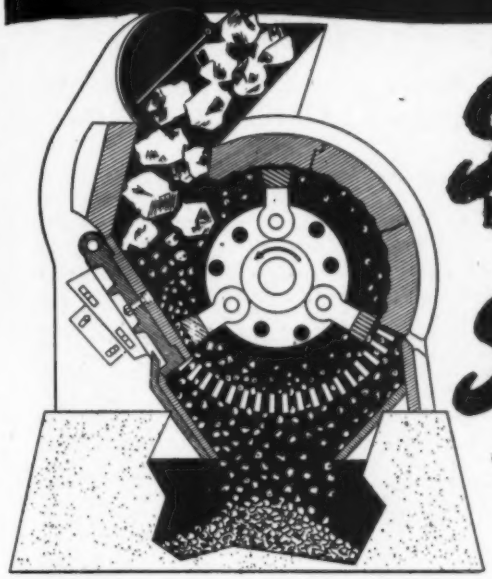
A dial-type potentiometer having a



13-in. scale length has been incorporated, and accuracy reportedly remains at 1 percent of full scale length.

A bridge-type circuit using a D'Arsonval galvanometer provides a null balancing method which eliminates errors usually encountered in direct indicating instruments. The four-point method used permits control of the depth of penetration by varying the distance between prods, which is in direct proportion to the depth of apparent resistance. By utilizing the Vibroground principle, Model 258 is said to remain unaffected by stray a.-c. or d.-c. currents and potentials.

DAY PULVERIZER-CRUSHER



Shatters MAN-SIZE STONE IN Seconds!

This sectional view of the down-running DAY swing hammer Pulverizer-Crusher manufactured by Brooks shows how most of the reduction is done before the rock reaches the grate bars.

● Hundreds of users all over the world report that dollar for dollar their DAY Pulverizer-Crusher outlives and outproduces other machines of this type because — (1) it's faster — designed to completely shatter man size stone in a matter of seconds . . . up to 75 tons per hour capacity, — (2) it's heavier — extra sturdy, massive and compact, and yet — (3) it is more readily accessible because of its simple design. Other advantages include extra take-up holes, interchangeable manganese steel side liners, reversible swing hammers, reversible screen bars, reversible rotor and many other maintenance-saving features.

Write for fully illustrated catalog

BROOKS EQUIPMENT & MFG. CO.

Distributors in all Principal Cities

224 DAVENPORT RD. KNOXVILLE, TENNESSEE

LONGER PRODUCING LIFE BUILT INTO FARREL-BACON CRUSHERS

Permanent strength and operating efficiency is engineered into these crushers at every vital point. Farrel-Bacon will provide industrial units or completely designed and equipped plants, including screens, elevators and conveyors. Also other types of mine, quarry, sand and gravel plant machinery. *Write for complete information.*

FARREL-BACON
ANSONIA, CONNECTICUT

BA-2

It DRIES
while it GRINDS
while it CLASSIFIES

The Hardinge "Thermomill" is an ingenious combination of Conical mill, air classification system and air preheater. It dries, grinds and classifies—in a single system—materials carrying an appreciable amount of surface moisture, reducing them to dry, finely-ground products.

The need for a separate dryer is eliminated.

Raw product is fed into the mill where it is ground and dried simultaneously. The ground particles are picked up by the air stream, oversize is returned to the mill feed by the classifier, and the product collector removes the finished material from the air. An auxiliary fan on the vent pipe (not shown) maintains a vacuum in the system for dust-free operation and pulls hot gases from the heater to the mill. Moisture is discharged through the vent.

Write your nearest Hardinge office for complete details.

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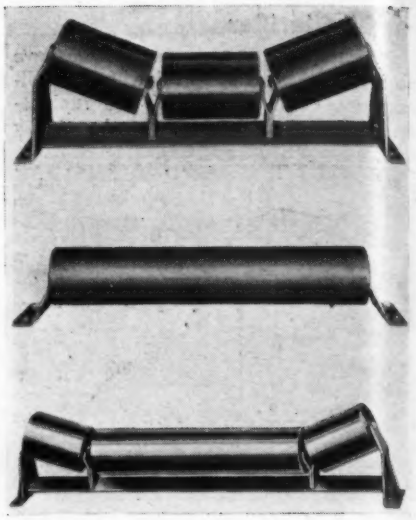
NEW YORK 17—122 E. 42nd St. • 205 W. Wacker Drive—CHICAGO 6
SAN FRANCISCO 11—24 California St. • 200 Bay St.—TORONTO 1

CONICAL MILLS | COUNTER CURRENT CLASSIFIERS | THICKENERS CLARIFIERS | RUGGLES-COLES DRYERS | CONSTANT WEIGHT FEEDERS | TUBE ROD AND BATCH MILLS



Three types of belt idlers made by the Palmer-Bee Company, 1778 Poland, Detroit, Mich. These idlers, identical for each width of belt, are removable and completely interchangeable. According to the manufacturer, the new feature embodied in "Lubricated for Life" ball bearings eliminates loss of production due to replacements and repairs.

● Heavy-Duty Mill Motor

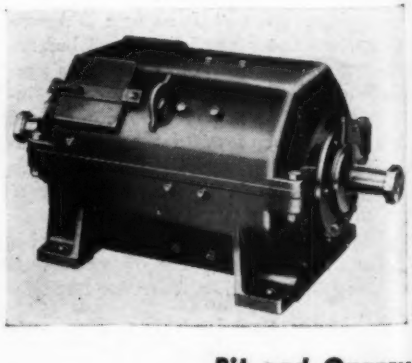
The Crocker-Wheeler Electric Mfg. Co., Ampere, N. J., announces the addition of the AISE Standard 600 Series mill motor to its line of d.-c. steel mill motors.

The new Crocker-Wheeler mill motor is adaptable for use totally-enclosed, non-ventilated, or separately ventilated. It can also be furnished suitable for self ventilation. The self-ventilated machines are cooled by a fan mounted at the rear of the armature; in the totally-enclosed, non-ventilated motors, the fan action is provided by the back ends of the coil supports. Effective internal circulation of air lowers hot spot temperatures.

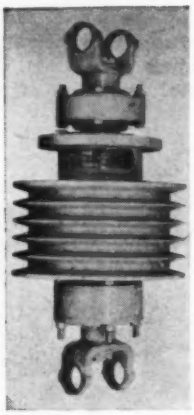
Shortened bearing housings, careful proportioning of field pole design, and the use of other modern developments in design and materials convert inactive space and weight into greater driving power.

Special grease slingers and grooves are provided to keep grease and dust away from commutator and windings. The bearing caps are removable to facilitate bearing inspections. The solid cylindrical roller bearings are completely supported against thrust and radial loads.

Improved commutation is provided by split brushes and four interpoles. Ready access to the commutator bolts is provided in all motors. The coils have extra support against vibration.



● New Power Take-Off



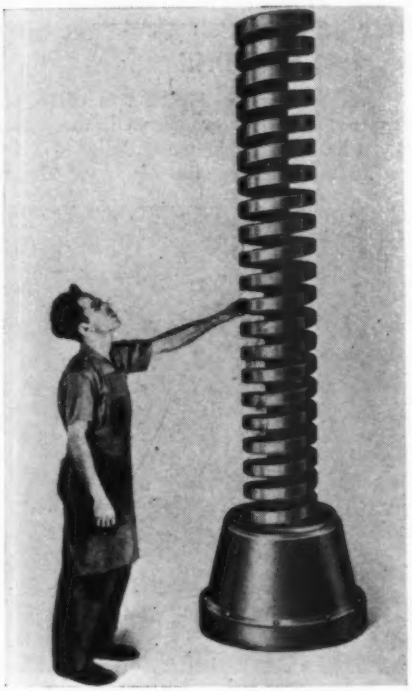
A new packaged, heavy-duty power take-off to fit all standard motor trucks has been developed by the Davey Compressor Co., Kent, O.

Known as the Davey P-80, the new take-off is guaranteed to transmit full engine power to the driving of heavy-duty truck-mounted equipment. The take-off unit itself is identical for all trucks.

Carefully engineered mounting parts for individual truck makes are maintained in stock at all times. Due to design simplification, it is estimated that take-off installation time has been reduced by 50 percent.

● Vertical Spiral Feeders

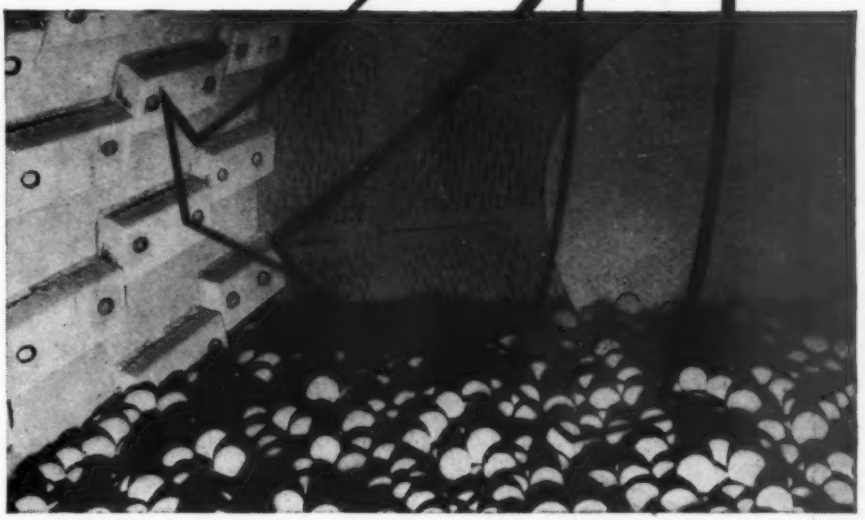
A new way of elevating or of lowering various types of bulk materials without using buckets, sprockets, gears, chains and motors is offered by the Syntron Company in its spiral elevating ramp. High-speed vibration causes the



material to flow up and around the ramp at rates controllable by a rheostat or reactor provided with each unit. There is no turning or rotating of the spiral ramp; vibration alone does the job.

These feeders are available in limited heights and diameters. The maximum tonnage required determines the diameter of the spiral ramp. They are available for operation from 110-, 220-, or 440-volt, a.-c. current. The Syntron Company, 375 Carson Avenue, Homer City, Pa.

Better grinding starts here



ASK the mill superintendents using **U·S·S LORAIN ROLLED PLATE LININGS.**

"All-time highs in lining life" . . . "New performance records" . . . "Lower maintenance costs" . . . "Replacements kept at a minimum"—are reports that are typical.

Why these outstanding results?

Because Lorain Linings are rugged and durable. Are adaptable to any mill, in the diameter, length or thickness required. And because they have been designed for quick, easy handling.

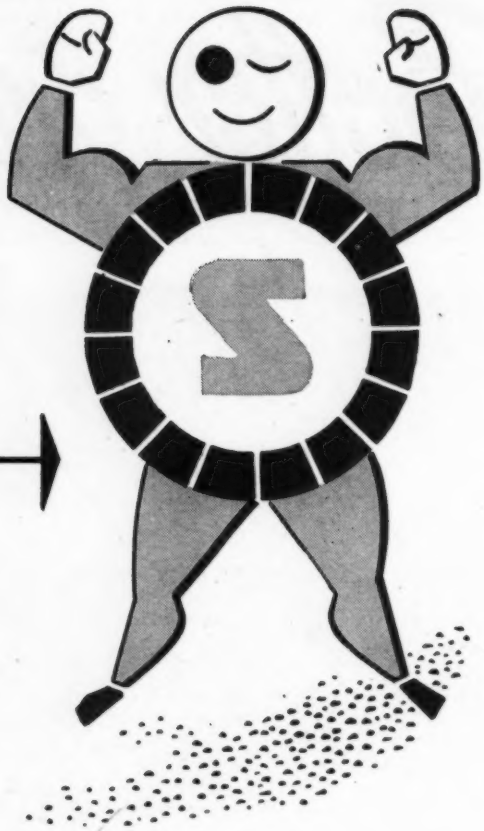
And on **U·S·S GRINDING BALLS,** reports have been equally favorable. That's because U·S·S Grinding Balls are forged from special analysis steel. Are accurately heat treated to take the punishment of the longest, heaviest runs. And because they maintain a standard of quality that insures uniformly superior results.

U·S·S Grinding Balls available in standard sizes from ¾" to 5" in diameter. Names of grinding mill manufacturers who distribute U·S·S Lorain Plate Linings will be furnished on request.

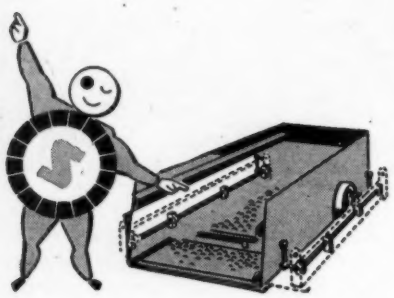
CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH & CHICAGO
COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY NEW YORK
8-1076

U·S·S · LORAIN ROLLED PLATE LININGS AND U·S·S · GRINDING BALLS

UNITED STATES STEEL



Let
SECO
solve your
vibrating
screen
problem

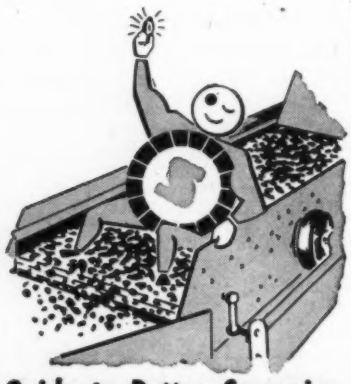


GET THIS EXCLUSIVE
FULLY CONTROLLED TRUE
CIRCULAR ACTION

Regardless of what material you screen, you'll benefit by Seco's smooth, trouble-free performance. Seco's patented equalizer assembly (in outline) controls the action of the screen body with resultant true circular action under all load conditions.

SCREEN MORE TONS
PER HOUR

The smooth action of a Seco keeps the load moving, reduces blinding and plugging of the meshes and by so doing—increases tonnages. Thousands of enthusiastic Seco users coast to coast have proven this. There's a right Seco for your screening job, too!



Write for A Guide to Better Screening

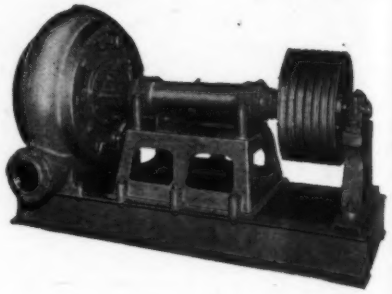
TRUE CIRCULAR MOTION VIBRATING SCREENS

SECO

SCREEN EQUIPMENT COMPANY, INC.
PRODUCERS OF VIBRATING SCREENS EXCLUSIVELY
Buffalo 21, New York
In Canada: United Steel Corp., Ltd., Toronto

● Sand and Gravel Pump

Since it is literally impossible to prevent wearing of parts in a pump handling solids consisting of gravel, sand, grit, etc., engineers of the new "Lightning"



pumps did the next best thing. By designing and perfecting a method of securing front and back side plates without bolts, they made disassembly and parts replacement a relatively easy matter. At the same time, the absence of bolt holes in the shell tend to strengthen and lengthen the service life of the shell.

All wearing parts of the pump are cast of a new alloy called Hi-Chro-Hi, a white, semi-steel. Overhaul of the pump is reduced to a basically simple operation. The Kansas City Hay Press Company, 801 Woodswether Road, Kansas City, Mo.

● Blast Hole Drill

The Sanderson Cyclone Drill Co., Orrville, O., has announced the new No. 1000 blast hole drill, designed primarily for the smaller quarry, where

the drilling range is from 5⅝-in. to 7-in. diameter holes. The drill is mounted on full crawlers. Overall length is 10 ft. 6 in. with drop-forge tread pads 12 in. wide.

The No. 1000 has a 35-ft. straight derrick, a power derrick hoist with a large working platform, and an adjustable starting pipe. The outstanding feature is the air spudder shock, which not only gives snap to the tool, but relieves the drill from undue vibration and strain. Gasoline, diesel or electricity may be used for power. The total weight of the drill is 17,400 lbs.

The Plant Operation

(*From page* 113)

Automatic vertical or radial seal adjustment is easily taken care of, as can be seen in the illustrations, as it is necessary merely to provide radial clearance over the width or rubbing contact. Seals must be designed to allow ready and rapid replacement or inspection.

It should be obvious that the smaller the diameter of the seal rings can be constructed, the less will be the gas leakage and the lower power and maintenance costs. Thus it is often a distinct advantage to attach the seals to reduced diameter conical dryer ends. With such an end reducer, the cone section at the discharge end of the cylinder must have conveying spirals or buckets to move the material out of the higher outlet. (Figure 4-A) Smaller diameter seals can also be provided through the use of cylinder end plates from which short small-diameter cylinders project. Figure 4-B shows this type of construction.

personal mention

The following promotions have been announced by officials of the Ideal Cement Company of Denver, Colo.:

J. C. ANDREWS, formerly division superintendent of the Northern Division, has been made chief production engineer. Mr. Andrews will supervise production at all plants, continuing to report to the general superintendent.

J. C. Andrews

O. A. Bayless

OTIS A. BAYLESS, who was chief chemist at Ada, Okla., has been promoted to division chief chemist for the Southern Division. Mr. Bayless will supervise the plant laboratories at Ada and Okay, Okla., Houston, Tex., and Mobile, Ala. He will retain his headquarters at Ada.

H. E. Born

HARRY E. BORN has been promoted from chief chemist at the Boettcher plant to division chief chemist, Northern Division. Mr. Born's new duties will include supervision of the plant laboratories at Portland, Boettcher, Devil's Slide, Trident and Superior.

FRANK S. ALTMAN, District Engineer of the Minneapolis Portland Cement Association office, was retired from active service effective October 6, 1948. Mr. Altman entered the employ of the Association on January 5, 1920 in the capacity of field engineer in Kansas. He was appointed district engineer of the Minneapolis district office on June 1, 1922. Serving continuously in this latter capacity, he has directed field promotion in Minnesota and North Dakota.

JUL Z. HOLLMANN, manager of the insulating materials division of the Flintkote Company and formerly general sales manager of the Celotex Corporation, was recently elected president of the National Mineral Wool Association.

HARRIS N. SNYDER, president of the Federal Crushed Stone Corporation of Buffalo, N. Y., has been appointed to a committee to aid the Transportation Association of America in its drive for the preservation of private ownership of the nation's common carriers.

CHARLES H. DICKENS, chief chemist and inspector at the Universal Atlas Cement Company's Waco (Tex.) plant, was recently appointed assistant plant manager; and HARRY W. HUNT, assistant chief chemist, was appointed to succeed Mr. Dickens.

Mr. Dickens has been chief chemist at the Waco plant for the last 19 years. He joined the cement company in 1922 at its Independence, Kan., plant, serving there as laboratory assistant and assistant chemist until April, 1929. At that time he was transferred to the Texas plant as chief chemist.

Mr. Hunt has worked continuously at the Waco plant for 20 years. He was made an analyst in 1940 and was appointed assistant chief chemist on March 1, 1947.

FRED R. MCCOMB, formerly district engineer at Minneapolis, was named to fill the vacancy created by Mr. Altman's retirement.

Mr. McComb was graduated in civil engineering from Purdue University, and after working in various engineering capacities entered the services of the Association in November, 1936, as a field engineer in Indiana. In this capacity he specialized in housing and structural promotion. After serving in the Corps of Engineers, U. S. A., for more than 3½ years during World War II, he returned to the Association as a field engineer in Indiana, handling promotion of concrete in all major markets.

H. F. GARVIN PELSUE has been elected a director of the Callanan Road Improvement Company, South Bethlehem, N. Y. Mr. Pelsue is president of the Metropolitan Sand & Gravel Corporation, Port Washington, N. Y.

WILBUR C. KLEINHANS, associated with Callanan since 1916, has been named treasurer of the firm.

Appointment of EDWARD J. LAUTH JR., M.D., as medical supervisor of Dravo Corporation and its subsidiaries, Pittsburgh, was announced recently. In making the announcement, the corporation management stated the company intends to re-emphasize and reinforce the importance of safety, accident prevention and employee health in all activities.

R. F. DERLING has has been appointed manager of the Portland Cement Association's west-central offices, succeeding R. W. WINTERS, who has resigned.

WEIR H. TRAVER was recently appointed sales representative for the Monon Crushed Stone Company of Monon, Ind. Mr. Traver was formerly a sales representative for the Elmhurst-Chicago Stone Company, Elmhurst, Ill.

New "Cold" Rubber Found Better for Industrial Uses

Use of "cold" rubber in many important products besides tires is seen by the Gates Rubber Company, one of the first large processors to receive supplies of a new synthetic in commercial quantities through participation with the Copolymer Corp. in pioneering the revolutionary "low temperature" processes.

"By cold-processing at temperatures of 41 deg. down to 0 deg., as against the 122 deg. previously required, we gain a greatly increased control over the molecular structure, resulting in a product which tests prove withstands abrasion fully 30 percent longer than the best natural rubber," says C. H. Mingle, Gates director of specialized research.

This greater resistance to abrasion has tremendous advantage in lengthening the service life not only of tires but also of all other products in which abrasion or wear resistance is a factor of importance. Such products include v-belts; many types of industrial hose; rotor tubes, stator tubes, impellers, pump cases and rubber-covered parts widely used in the mining and pit-and-quarry industries;

obituaries

F. C. Field

FREDERICK C. FIELD, for 23 years asphalt chemist with The Asphalt Institute, who with Prevost Hubbard of the institute was co-inventor of the Hubbard - Field Stability Machine, passed away on June 29 in St. John's Riverside Hospital, Yonkers, N. Y. He was 72 years of age and had been ill for several weeks.

Born in 1875 in Collingwood, Ontario, Canada, Mr. Field came to this country in his youth and was graduated from the University of Washington at Seattle. In that city in 1906 he received the appointment of chemist in the City Engineer's Department. He later served as city chemist in Calgary, Alt., Canada.

In 1924, when The Asphalt Institute (then the Asphalt Association) installed its laboratory, Mr. Field came to New York and was appointed chemist to work with Prevost Hubbard, chemical engineer of the institute. Their first project was to devise and develop an outline of the stability test, later perfected jointly under their names.

Mr. Field's active work, as head of the laboratory phase of the research activities of the Institute terminated with pension retirement as of December 31, 1946.

ERVIN B. STEVENSON, of Albany, N. Y., engineer, who was associated with the Alpha Portland Cement Company, died on August 16 in an Albany hospital. He was a former deputy city engineer of Albany.

E. H. BRAYER, president and treasurer of the Rock Asphalt Company and formerly chief executive officer of the Great Lakes Transit Corporation, died last summer at Buffalo, N. Y., at the age of 48 years.

DANIEL A. HAMILTON, 82, president and manager of Gallagher Brothers, Hamilton, Ont., lime and stone firm, died on July 7 at his home after a lengthy illness. Mr. Gallagher's firm has supplied lime and stone to the Hamilton area for many years.

J. W. HARMAN, 62, who helped to organize a predecessor company of the Ohio Valley Sand Company, died on July 27. In recent years Mr. Harman had been engaged in general river towing, particularly of slag, from Weirton, W. Va., to various construction projects.

CAPT. HERBERT C. WHITEHURST, 61, director of the District of Columbia Highway Department, died of a heart attack on September 1 at the George Washington University Hospital. He had just returned from a vacation near Irvington, Va., and was apparently in good health.

Capt. Whitehurst had long been identified with the American Road Builders' Association. At the time of his death, he was treasurer of A.R.B.A., having been elected in 1940. He was president in 1935-36 and the first president of the municipal division, then the city officials' division.

During World War I Capt. Whitehurst served in the United States and abroad as a combat engineer, and during World War II he was head of the District Department of Civilian Defense, and commander of the city's civilian defense corps. During this time, he continued to supervise the district highway department.

Under Capt. Whitehurst's administration of 22 years, the mileage of paved streets in Washington was nearly doubled. When he came to the commission in 1926, there were 550 miles. Today there are close to 1,000 miles.

PHILIP M. SKINNER, owner of the United Materials Company at Houston, Tex., died on August 17 in Galveston. He was 64 years of age.

EDWARD GRAFF, 47, who was associated with the Tews Lime & Cement Company for 27 years, died on August 17 at his home in Milwaukee, Wis.

ISAAC L. WILLIAMS, former supervisor of the roofing department of the Fischer Lime & Cement Company of Memphis, Tenn., died at his home in that city on August 17. He was 66 years of age.

HARLEY GOANS, a foreman at the Eldred Stone Company's quarry at Eldred, Ill., died on August 31 at a hospital in Carrollton, Ill., of injuries sustained in a fall. He plunged from a 50-foot ledge at the quarry while apparently trying to move a large drill. There were no witness of the accident. Mr. Goans, aged 50, had been an employee of the Eldred Stone Company since 1923.

ARTHUR F. BOSS, special representative for the Medusa Cement Co., died unexpectedly in his office in Cleveland, O., on July 22. He was 61 years of age and was widely known among construction engineers.

Mr. Boss had been associated in earlier years with the Universal Atlas Cement Company and the Cleveland Builders Supply Company.

A coal dust explosion at the plant of the Whitehall Cement Co., Cementon, Pa., took the life of WALTER MICHLANSKI, 29, motor tender, who was injured while working on an elevator motor in the coal mill. Sparks shot from the motor, igniting the coal dust. Michlanski died of burns a few hours later. The motor was the only equipment damaged.

WILLIAM R. KLECKNER, plant manager of the San Juan Cement Co. and chief chemist of the Pacific Portland Cement Association, died at his home in Oakland, Calif., on September 2. He had been in poor health since June.

After graduation from Muhlenberg College, Mr. Kleckner was associated with the National Slag Co., Allentown, Pa. Later he went to Bautista, Calif., as chief chemist for the San Juan Cement Co.

MISS BEULAH M. DAVIES, secretary to A. T. Goldbeck, engineering director of the National Crushed Stone Association, died on September 15 after an extended illness. Miss Davies had occupied this position from 1925, when N.C.S.A. headquarters were moved to Washington, D. C., until 1947, when she retired because of ill health.

GEORGE M. RICHARDSON, treasurer of the National Portland Cement Company, died recently at his home in Pitman, Pa. He was 70 years of age.

JOSEPH V. KOHLER, who was associated with his father, Victor Kohler, in the Kohler Bros. Sand & Gravel Company at Waukesha, Wis., died on August 26.

Potash Production and Sales In 1947 Establish New Records

Both production of marketable potassium salts and sales reached new highs, according to reports by producers to the Bureau of Mines. Production in 1947 was 1,905,776 short tons of potassium salts containing 1,029,875 tons of equivalent potash (K_2O). This was an increase of 218,041 tons of potassium salts over 1946, and 98,063 tons of K_2O.

Sales (1,953,307 short tons) were 280,058 tons greater in 1947 than in 1946, and contained 1,053,266 tons K_2O. The value of the sales in 1947 was over $34,000,000. Stocks of potassium salts in producers' hand at the end of 1947 were much less than on Dec. 31, 1946. Both imports and exports of fertilizer potash materials increased in 1947, but those for chemical uses declined. Domestic consumption of potash made a new high record, apparent consumption reaching 1,001,442 short tons K_2O.

The United States Department of Commerce reported recently that interest in potash deposits discovered near Bremen, Germany, before World War II is currently being revived. Large reserves of potash in eastern Germany are now said to be controlled by the Soviet occupation authorities.

trade notes

Charles K. McArthur, an engineer of The Dorr Company, with 22 years of experience in many phases of its engineering activities, has opened an office in the Lloyd Building, Seattle 1, Wash. He will be the company's permanent representative in all lines of work in Washington, Oregon and Idaho. Mr. McArthur until recently was manager of the North American Division of The Dorr Company, with headquarters in New York; and prior to that, manager of branch offices in Western states and Canada.

Edward R. Boate

Edward R. Boate has recently joined the engineering staff of the Bacon-Pietsch Co., Inc., 149 Broadway, New York, N. Y., in the capacity of assistant to the president.

Mr. Boate was formerly chief engineer of the North Jersey Quarry Company, Morristown, N. J., and had been affiliated with that firm for 19 years. Bacon-Pietsch are consultants in crusher design, stone, sand-and-gravel, transit-mix, bituminous concrete and batch plant layouts.

D. K. Heiple

Danforth K. Heiple has been promoted to chief field engineer for R. G. LeTourneau, Inc., according to an announcement by Roy E. McCluskey, vice-president and general sales manager of the company. He succeeds R. C. Lewis, who resigned.

Mr. Heiple will give sales assistance to LeTourneau distributors in planning equipment applications and compilation of earthmoving production and cost. He joined LeTourneau as field engineer in 1945.

Charles S. Redding recently observed his 40th anniversary with Leeds & Northrup Company, manufacturers of electrical measuring instruments, automatic controls and heat treating furnaces. He has been president of the company since 1939, when he succeeded the founder, Morris E. Leeds, upon the latter's election as chairman of the board. Mr. Redding first entered the employ of Leeds & Northrup as a draftsman in 1901.

Appointment of Charles S. Weber as advertising manager of The Thew Shovel Company, Lorain, O., has been announced by J. L. Beltz, manager, sales promotion. Mr. Weber was formerly production manager of The White Advertising Co. of Cleveland.

At a meeting of directors of St. Regis Sales Corporation, subsidiary of St. Regis Paper Company, the following new officers were elected in addition to those already serving: Arch Carswell, executive vice-president; H. W. Sloan, vice-president and director; John F. Gruber and Walter M. Neill, vice-presidents.

R. I. Parker of Chicago has been elected a commercial vice-president by the board of directors of the General Electric Company, it was announced recently by Charles E. Wilson, G-E president. Effective July 1, Mr. Parker succeeded W. O. Batchelder, who retired after 43 years of service.

EAGLE
MODEL 400
LOADER

LOWER YOUR LOADING COSTS

ECONOMY moves in when an EAGLE moves dirt—or any other loose material. Because it is mobile, speedy, versatile *and* economical, it is invaluable around quarries, stock piles and road building jobs.

- One man operation
- Job to job at truck speeds
- Hydraulic controls

Write for detailed specifications!

EAGLE
JAW CRUSHERS · IMPACT BREAKERS
PULVERIZERS · CONVEYORS · LOADERS
CRUSHER CO., Inc. GALION OHIO·U·S·A

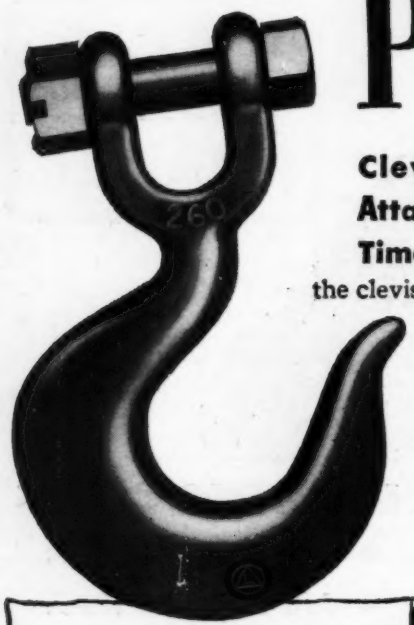
PULVERIZERS

Have you investigated our new BRADLEY HERCULES MILL?
Unquestionably the last word in Economy and Simplicity.

(Send for New Catalog No. 59)

BRADLEY PULVERIZER CO.
ALLENTOWN, PENNA.

Here are Hooks that hoist your Profits!



Clevis Hoist Hook Is Quickly Attached . . . Changed . . . Saves Time and Labor. Slip the bolt through the clevis, spin the nut, spread the cotter and this heat-treated hook's ready and safe for your toughest jobs. No welding, no spelter, no connecting fittings required. Send for Laughlin's famous data book of industrial fittings . . . Catalog No. 140.

THE THOMAS LAUGHLIN CO.,
DEPT. 3, PORTLAND 6, MAINE.

Laughlin Safety Hook . . . "The Latch Locks The Load" . . . adds a big safety factor to every lift. Sturdy latch, stainless steel spring. For every industrial application.

Laughlin Replacement Swivel Hook Assembly with Safety Latch. Bolts on and off . . . no machining . . . no threading. For hoists, cranes, lashing operations. One-ton and half-ton sizes.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS

The Four Wheel Drive Foundation has been incorporated under Wisconsin law for the exclusive purpose of charitable, educational, scientific and literary work, according to Walter A. Olen, president of The Four Wheel Drive Auto Company. The foundation was organized on June 17, and the first meeting was held on June 29.

Articles of incorporation of the new foundation permit gifts and grants to charitable, educational, scientific and literary associations, corporations, institutions and societies, as well as to individuals. Educational aids by the foundation may include scholarships and fellowships to FWD employees.

George C. Stoddard, chairman of the board of directors, announced the retirement of H. L. Watson as president of De Laval Steam Turbine Co., Trenton, N. J., after 35 years of active service. George W. Smith Jr., was named his successor. Mr. Watson will continue with the company's management as a director and the chairman of the executive committee.

A pre-war dream became a post-war reality when E. F. Houghton & Co. of Canada, Limited, manufacturer of industrial oils, chemicals and leathers, began operations in its new Toronto plant, under the direction of E. H. MacInnis, vice-president and director of sales.

The new plant, an affiliate of E. F. Houghton & Co. of Philadelphia, will specialize in the manufacture of metal-working products such as carburizers, quenching oils, cutting oils, heat treating salts and drawing compounds.

Harlowe Hardinge, president of Hardinge Company, Incorporated, announces the appointment of William H. Shank as advertising manager. He succeeds R. C. Ferguson, who is now Hardinge North Central District manager. Mr. Shank had previously been a staff member of The W. H. Long Co.

Stearns Magnetic Mfg. Co. is moving into a modern addition to its Milwaukee plant, erected to take care of the increased demand for magnetic equipment. The firm manufactures magnetic separators, pulleys, drums, concentrators, lifting magnets, clutches and brakes.

The new building will house the administrative division on the second floor, including general and executive offices and generous space for engineering. The ground floor has been devoted to an enlarged, fully equipped laboratory.

A new 16-mm. color-sound film featuring heavy rock excavation on four interesting construction projects has been prepared by Gardner - Denver Company of Quincy, Ill. Entitled *Man Against Rock,* this film is purely educational in nature and carries no advertising throughout its 33-minute run. Prints are available for showing to schools, engineering societies and other organizations interested in this type of work. The film presents a dramatic portrayal of rock drilling, blasting, mucking and other phases of construction work.

G. P. Haberstein

Arch Carswell, executive vice-president of St. Regis Sales Corporation, subsidiary of St. Regis Paper Company, announces the appointment of George P. Haberstein as Eastern sales manager and Logan G. Hill as assistant Eastern sales manager of the Multiwall Bag Division of the company. Walter M. Neill, formerly Eastern sales manager, was recently elected a vice-president of St. Regis Sales Corporation.

Mr. Haberstein became associated with St. Regis late in 1947 as assistant manager of the advertising, publicity and sales promotion department.

Mr. Hill has been associated with sales promotion and multiwall sales of St. Regis since 1930.

Because the name "Chase" has held public confidence through unfailing integrity and reliable quality for over half a century, the Chase Bag Company was selected by the Brand Names Foundation to receive the "Certificate of Public Service."

The award, created by the foundation to recognize the proven value of brand names in their service to the public, was presented to F. H. Ludington, president of the Chase Bag Company, at a dinner at the hotel Waldorf Astoria in New York, sponsored by Brand Names Foundation, Inc.

Independent Pneumatic Tool Company, manufacturers of Thor portable power tools, announces the opening of a new administration building adjacent to its main works at Aurora, Ill.

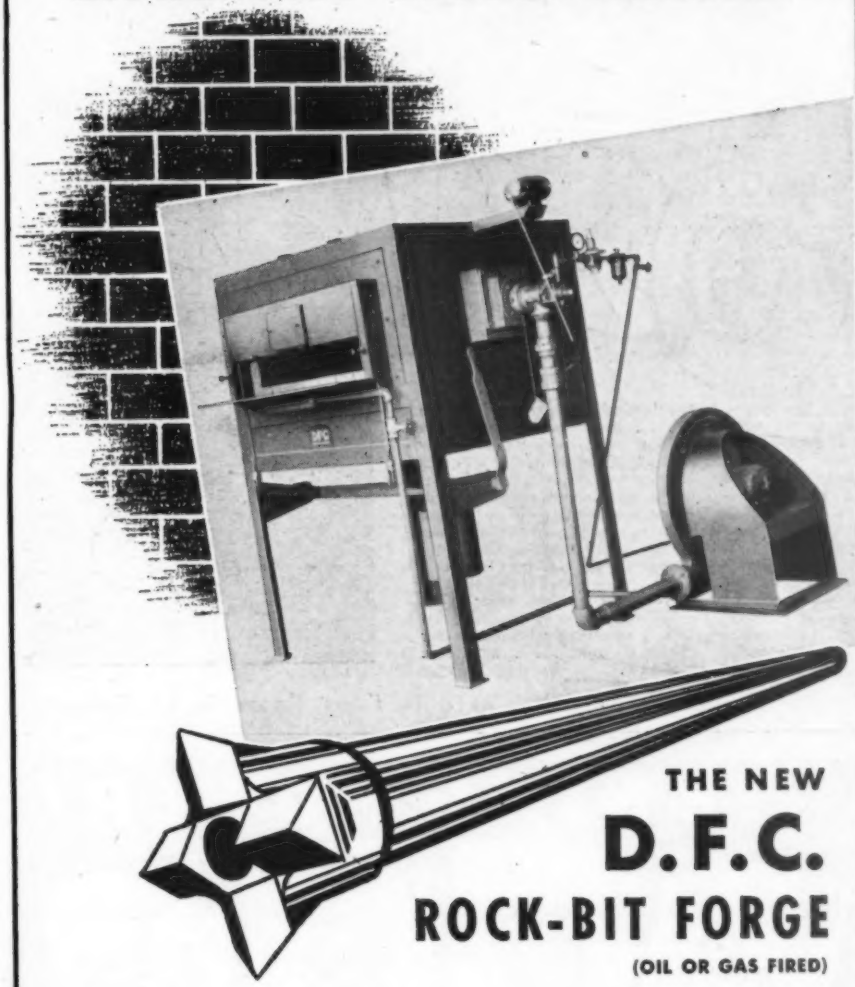
The building, constructed and equipped at a cost of $1,500,000, will accommodate Thor's entire executive and administrative staff, the major portion of which was transferred to Aurora from Chicago for consolidation with other office divisions previously located within the Aurora works. The company's Chicago sales branch will retain temporary headquarters at the former general office address, 600 West Jackson Boulevard, until construction of a new branch office building is completed.

An important milestone in the production and use of diesel engines was reached when the manufacture of the 250,000th General Motors Series 71 2-cycle diesel engine was announced by W. T. Crowe, general manager of the Detroit Diesel Engine Division.

The quarter of a million engines produced by this one factory represents an impressive total of over 40,000,000 horsepower, four times the total diesel horsepower in existence in January, 1938, when the division first started operations. The figure is estimated by engineers to be sufficient to power 190 ocean-going ships comparable to the *Queen Elizabeth*.

ROCK-BIT

LIFESPAN LENGTHENED



THE NEW

D.F.C.

ROCK-BIT FORGE

(OIL OR GAS FIRED)

Ideal for any heating operation involving detachable rock bits.

- THREAD FORMING
- HOT MILLING
- HEAT TREATING

- Excellent performance at any temperature to 1900° F.
- Uniform temperatures throughout roomy 27 in. by 24 in. hearth.
- Installation space only 92 cu. feet. (floor space—16 sq. ft.)

WRITE FOR BULLETIN DB-1

The DENVER FIRE CLAY Company

EL PASO, TEXAS · NEW YORK, N. Y. · DFC · SALT LAKE CITY, UTAH

DENVER, COLO., U. S. A.

30 SECONDS...and another load of rock is on its way with the DEMPSTER DUMPSTER SYSTEM

Attach two chains to the loaded container . . . pull a lever in the truck cab . . . the load is hydraulically lifted into carrying position and you're on your way to the crusher in less than 30 seconds. That quick pick-up is important, but just as important is the fact that your loading crew is continuously loading containers. Trucks don't stand idle waiting to be loaded . . . there's no waiting by loading crews between truck trips. This cycle of continuous loading, continuous hauling is the secret behind the low cost Dempster-Dumpster System. One truck hoisting unit handles any number of containers spotted through your quarry . . . does the work of 4 or 5 conventional trucks. Cost of installing is remarkably low, write for catalog 247 today. Photo at right shows automatic dumping operation at crusher.

DEMPSTER BROTHERS, INC., 2118 N. Knox, Knoxville 17, Tennessee

WINNING POWER!

WISCONSIN HEAVY-DUTY *Air-Cooled*—ENGINES

Four of a kind — winning power to spare in this hand! The same winning power you draw when you specify Wisconsin Air-Cooled Engines for your equipment . . . compact, heavy-duty singles in two types ranging from 2 to 9 hp.; twin-cylinder models from 7 to 13 hp., and V-type 4-cylinder engines from 15 to 30 hp.

All models are designed for heavy-duty service — delivering "Most Hp. Hours" of on-the-job service.

All models are extremely compact . . . to fit the machine as well as the job.

All models are built to one standard of top-quality excellence in design, materials and precision construction.

For "Winning Power", specify Wisconsin Air-Cooled Engines. Engineering data gladly supplied.

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 14, WISCONSIN

Euclids Move the Earth, the new full 16-mm. sound film covering Euclid's complete line of off-the-highway earth-moving equipment has been released by The Euclid Road Machinery Company, Cleveland 17, O.

Filmed by Euclid cameramen, the movie illustrates the various applications of earth-moving equipment.

This 30-minute presentation, which was previewed at the A. R. B. A. Road Show in Chicago, is now available for booking. Requests should be addressed to Euclid representatives or distributors or directly to the sales development de-department of the home office.

The recently completed plant of the Bemis Paper Bag Company at Vancouver, Wash., has reached full production and is now completely serving the territory previously served by the Bemis plant at St. Helens, Ore.

Lloyd R. Leaver, president of Joseph Stokes Company, Ltd., Welland, Ontario, Canada, was elected a vice-president of the Thermoid Company at a meeting of the Board of Directors on August 9. Mr. Leaver will manage Thermoid's industrial rubber products division. He will continue to direct the policies of the Canadian subsidiary from Trenton.

Chain Belt Company announces the opening of a new district sales office at 2900 West Clay Street, Richmond 21, Va. Fred W. Taylor will be district manager of this office. Mr. Taylor was with Chain Belt Co. from 1936 to 1946 as a sales engineer and later district manager of the Atlanta district office.

Five additions to the field sales force of The Raybestos Division of Raybestos-Manhattan, Inc., Bridgeport, Conn., have recently been announced by J. L. McGovern Jr., replacement sales manager.

In the Chicago district, which is supervised by Fred H. Lugar, the following additions have been made: Robert E. Kranz will cover the Indiana and northern Kentucky territory; Van E. Aldrich will cover the western Michigan territory; Harold Daub has been assigned to the Nebraska territory, and Henry W. Clere will work most of Iowa.

In the Southeastern district, which is supervised by C. H. Robinson, the addition of Erby W. Feathers of Bristol, Virginia, has been announced. In the Metropolitan New York, district Erwin W. Daly has been made a territorial representative. He will cover the area of Long Island and Brooklyn. This district is supervised by M. J. Callahan.

Kenneth D. Lozier, vice-president St. Regis Sales Corporation, subsidiary of St. Regis Paper Company, announced the appointment of Norton B. Jackson as advertising manager of the company. Mr. Jackson came to St. Regis from the American Can Co., where he had acted as advertising manager.

Don V. Stone has been named district representative to serve "Caterpillar" distributors in Indiana, Kentucky and a part of Ohio, the territory formerly served by C. M. Adams. He will represent the company in contacts with the Roy C. Wayne Supply Co. in Louisville, Ky., the MacAllister Machinery Co. of Indianapolis, Ind., and Highway Equipment Company of Cincinnati, O.

N. H. Orr, vice-president in charge of sales, announces the appointment of A. S. Rairden as wire rope sales manager for The Colorado Fuel and Iron Corporation, its subsidiaries and divisions. He joined the Wickwire Spencer Steel Division in October, 1933, as wire rope sales engineer and became wire rope sales manager of Wickwire Spencer Steel Company prior to its merger with The Colorado Fuel and Iron Corporation.

At the same time the appointment of E. L. Klingler as wire rope sales engineer for The Colorado Fuel and Iron Corporation was announced. In his new capacity he will continue the supervision of the expanded sales engineering force and act as assistant to Mr. Rairden.

To assist the designer and engineer to use arc welded steel in the design of all types of machinery in many hundreds of different industries, The Lincoln Electric Company has recently released a new movie entitled *Designing Machinery for Arc Welding.*

This 16mm. sound color movie gives examples of the four fundamental elements of all machinery: bases, wheels, containers and covers. It compares various materials and presents a study of load factors, stresses, rigidity, performance and appearance. It explains how welded design permits freedom of planning, speeds up fabrication, reduces weight and permits greater strength.

The Committee on Engineering Education of Compressed Air and Gas Institute, 1404 Terminal Tower, Cleveland, O., announces a 30-minute illustrated lecture on compressed air power and its modern industrial applications.

Produced primarily as a teaching aid requested by engineering schools and colleges, and reviewed by a group of engineering professors, *Compressed Air in Action* contains 61 illustrations in either 35 mm. continuous strip film or 2- by 2-in. film slides. The lecture is available at cost to industrial organizations, technical societies, high schools, vocational schools, foremen's clubs, service clubs and any other interested groups. Its up-to-date information will be found valuable by anyone concerned with the application of compressed air.

A simplified, low-cost rotary furnace has been designed by the AleXitE Division of the Alexander Film Company, Colorado Springs, Colo.

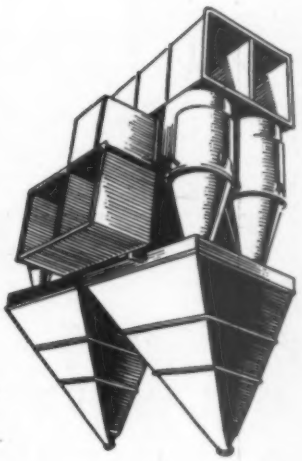
This piece of equipment was developed in response to users of the company's PerAleX, who can now purchase carlots of classified ore from the mine, thus effecting a considerable saving in transportation costs.

PRACTICAL

dust

RECOVERY

can be a reality

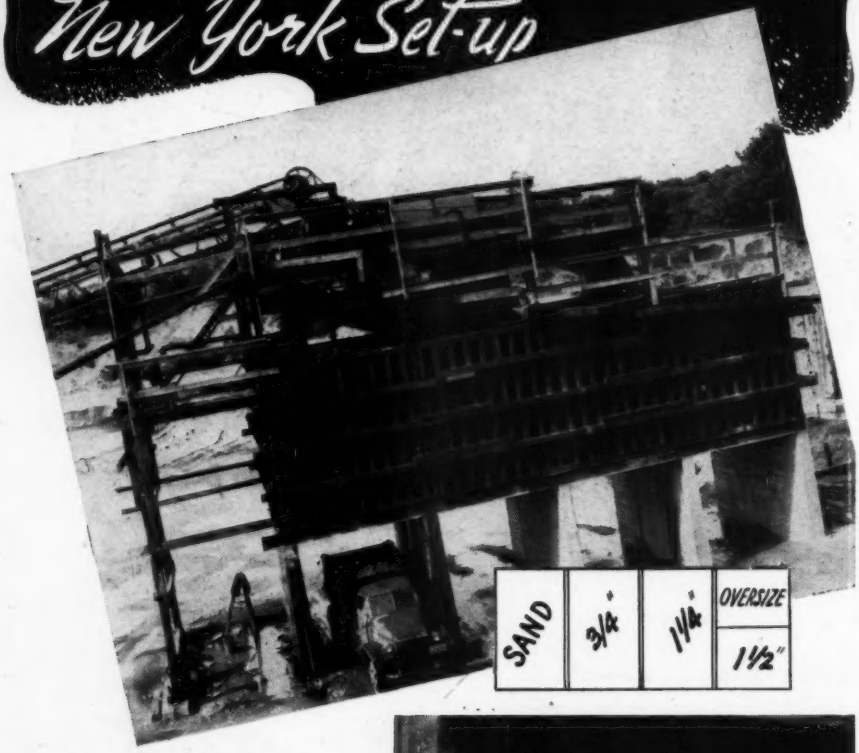


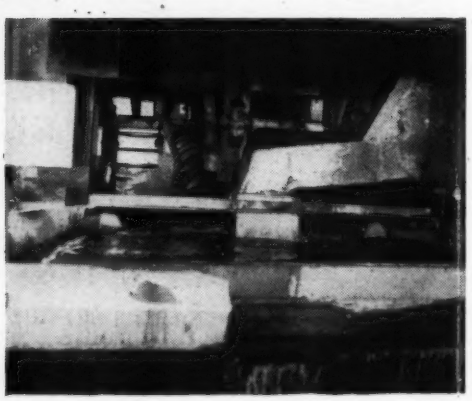
. . . if you logically consider the problem. Too few dollars can easily buy disappointing efficiency while it is just as possible to overinvest with the same result. That's where the Buell van Tongeren Cyclone comes in. With a patented "Shave-Off" to overcome the "double eddy" evil, it can be big enough to overcome plugging hazards. Individually engineered for each specific application Buell is in a class apart in achieving high fractional efficiencies. There's convincing data in the 1948 Buell catalog. Write to: Buell Engineering Company, 12 Cedar Street, Suite 5000, New York 5, N. Y.

buell

Engineered Efficiency in DUST RECOVERY

In This Compact New York Set-up





EAGLE

- WASHES
- CLASSIFIES
- DEHYDRATES

Fine Material

They don't come much neater than this arrangement of a rotary screen and Eagle Washer-Classifier-Dehydrator over the loading bin compartments at the I. Pshonick & Son plant at Liberty, N. Y. The sand from the Eagle and the four classifications of stone from the screen follow the shortest possible route to their respective compartments.

Different grades of sand are obtained by excavating various veins in the pit and by varying the amount of water, speed of the Eagle, and length of adjustable weir. Note how the material is piped right to the built-in Eagle feed box in the lower view. This assures the exact point of feed-in for top results and has a baffle to prevent turbulence. The U-shaped weir with adjustable lips assures precise classification control. The rising column of water under the tumbling action of the conveyor screw floats out all trash and excess fines. Get the details in Catalog 47.

SINCE 1872 Progress...Service

Sand and Gravel Equipment

"SWINTEK" DREDGE LADDERS — SCREW WASHERS
LOG WASHERS — DEHYDRATORS — SAND TANKS
CLASSIFIERS — REVOLVING SCREENS

EAGLE IRON WORKS

133 Holcomb Ave. • Des Moines, Iowa

C. M. Gegenheimer has been named district manager in charge of the Chicago office of Marion Power Shovel Company of Marion, O. He succeeds David E. Rizor, who has been transferred to the company's home office. Mr. Gegenheimer comes to the Chicago position after two years as district manager in charge of Marion's St. Louis office. His successor at St. Louis is A. W. McGraw.

William Robinson Huey, general traffic manager of the Bemis Bro. Bag Co., died August 22 at his home in Evanston, Ill., following a long illness. He was 69 years old. Mr. Huey joined Bemis in 1913 at St. Louis and was in charge of traffic there until his appointment as general traffic manager at Chicago in 1934.

A. C. Monteith, 46-year-old engineering executive of the Westinghouse Electric Corp., has been elected vice-president in charge of engineering and research. He succeeds Marvin W. Smith, whose election as executive vice-president of Baldwin Locomotive Works was announced.

Mr. Monteith joined Westinghouse in 1923 and was assigned to the central station engineering department in 1924. He became manager of that department in 1938 and in 1941 was named manager of the industry engineering department. In 1945, he took over the dual position of manager of headquarters engineering departments and director of education.

James Boyd

James Boyd, formerly Eastern district manager of the Westinghouse Electric Corp., has been appointed general sales manager of the Lima-Hamilton Corporation's Hamilton Division.

Mr. Boyd joined Westinghouse in 1917 as service engineer. In 1920 he went into the firm's New York office as a salesman in the general industry section, in 1925 he was promoted to the post of supervisor of the general mill section, and in 1935 he became Eastern industrial manager. He was made assistant Eastern district manager in 1937, and became Eastern district manager in 1938.

In 1942 Mr. Boyd was presented the Westinghouse order of merit "for outstanding contributions to the company's progress."

Harry R. Powers, a veteran of over 23 years of construction equipment sales and service, was recently appointed Eastern sales manager for R. G. LeTourneau, Inc., according to an announcement by R. P. Nichols, assistant to the general sales manager for the company.

Mr. Powers has been district sales representative for LeTourneau since joining the staff after his military discharge in 1945. He succeeds E. M. Ferguson, who has resigned from the company.

legal decisions

By LEO T. PARKER

Engineer Acted Arbitrarily

A new higher court decision held that a contractor cannot recover payment for such work as excavating, construction or paving if the work is *not* done in strict accordance with the specifications, although the engineer in charge approved the work.

For example, in *Uvalde Rock Asphalt Company v. Fantham,* 210 S. W. (2d) 646, it was shown that a city let a paving contract which provided that the contractor would perform "good workmanship". Also, the contract contained a clause that payment by the city would be made when the engineer approved the work.

The city refused to pay the contractor on the grounds that there was a substantial departure from the specifications, and that the engineer had practiced fraud in approving the work.

The higher court refused to order the city to pay the contractor, and said: "The contract was not honestly and faithfully performed in the particulars stated. . . . So, in executing the acceptances, the only inference that the evidence will bear is that Edminster was not acting on his own knowledge and judgment, and so was acting arbitrarily and capriciously."

Pneumoconiosis Defined

Recently a higher court defined the term "pneumoconiosis" to cover all dust diseases of the lungs, and stated that the word "silicosis" described a specific dust disease due to the inhalation of free silica. The term "pneumoconiosis" includes the term "silicosis". Therefore, an employe who for a number of years has had the disease silicosis may receive compensation based on *permanent disability* when finally he contracts tuberculosis.

For example, in *Mercatante v. Michigan,* 31 N. W. (2d) 712, it was shown that on December 12, 1943, an employee was hospitalized for influenza, followed by pneumonia. On January 8, 1944, he was transferred to a hospital. Later it was decided that he was permanently disabled by tuberculosis. He applied for compensation.

During the trial the testimony showed that he was "first seen in the Herman Clinic for X-ray in 1937." At this time a diagnosis of third degree silicosis with superimposed tuberculosis was made.

In view of this testimony the higher court awarded the employee compensation based on permanent disability.

Limit of Liability

A few days ago a reader wrote as follows: "We had a car of cement destroyed in a flood while it was being transported by a common carrier. The latter has refused to pay us the value of this cement, claiming that its liability was limited to $250. Can this be true? We did not know that the bill of lading contained any limitation of the carrier's liability."

The answer to this question is interesting and informative to all readers.

First, it is important to know that all higher courts agree that a common carrier can *limit* its liability for loss of or destruction to transported goods if the limitations of value in bills of lading and in tariffs are *on file* with the Interstate Commerce Commission. The shipper is bound by the limitation clause although he *has no notice* or other information

OSGOOD
Air Control
FOR Safe,
Easy Operation

Husky, powerful machines . . . built to handle the most difficult work . . . yet, with OSGOOD Air Control, operating an OSGOOD is simple and easy. A bank of four hand levers and two foot pedals, all within convenient reach of the operator, provides safe, positive control of the basic operations of an OSGOOD.

And OSGOOD Air Control is metered—giving an ease of operation that means more work, in less time, on any job. Write today for specifications.

POWER SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES • PILE DRIVERS

THE OSGOOD CO. O-G THE GENERAL CO.
EXCAVATOR
MARION OHIO

DIESEL, GASOLINE OR ELECTRIC POWERED • ⅜ TO 2½ CU. YD. • CRAWLERS & MOBILCRANES

Permanence and low-maintenance . . . two measurable advantages to be gained by constructing storage bins of concrete. You can count on years of service from a properly designed and expertly constructed concrete storage bin. And little in the way of maintenance will be needed. Certainly no protecting paint.

Nicholson qualifies well as the "voice of experience" in the field of concrete storage bins including their "in and out" handling facilities and processing equipment, for it was in 1914 that this company started in business. Many a yard of Nicholson Concrete has been poured since.

Consultation with our engineering staff on your storage and handling requirements doesn't obligate you in any way. It may help you while formulating plans.

Construction costs are not coming down!
BUILD NOW

BULK STORAGE COAL-GRAIN-LIQUID STORAGE HANDLING EQUIPMENT
THE NICHOLSON CO.
CONSTRUCTION CEMENT-OIL-CHEMICALS

10 Rockefeller Plaza New York 20, N. Y.

that the carrier has limited its liability for loss or damage to goods during transportation. See 54 Atl(2d) 575.

In this case the higher court held a carrier liable for only $26 for destruction of goods valued at $900 because its bill of lading and tariffs on file with the Interstate Commission contained a clause limiting the carrier's liability to this amount.

Fair Labor Standards Act

Modern higher courts consistently hold that employees engaged in *any part* of production or processing of goods for interstate shipment may recover wages specified by the Fair Labor Standards Act.

In *E. C. Schroeder Company, Inc., v. Clark,* 167 Fed. (2) 739, it was shown that certain employees were engaged in quarrying and processing stone for gravel cushion and riprap. Other employees hauled the finished product to a dike being constructed around an oil field where crude oil was produced for shipment to purchasers outside the state.

The higher court held that *all* these employees were entitled to wages specified by the Fair Labor Standards Act.

For comparison, see *Schroeder Company v. Clifton,* 328 U. S. 858. The United States Supreme Court held that employees of the company engaged in the quarrying and processing of stone for gravel cushion and riprap for a dike were entitled to overtime compensation, liquidated damages, and attorney's fees, under the Fair Labor Standards Act.

Damages vs. Compensation

All courts agree that an injured employee may recover damages from his employer *only* when the injury resulted *from negligence* of the employer. But an employee can receive compensation under the State Workmen's Compensation Act if the injury was sustained while the employee was attending to his regular work, whether through negligence of the employer or otherwise. Also, higher courts hold that an employee protected by the State Workmen's Compensation Act cannot sue his employer for damages.

For instance, in *Masich v. United Refining Mining Company,* 191 Pac. (2d) 612, it was shown that an employee was suffering from an occupational disease known as silicosis. The employee contended that he contracted the disease because his employer failed to furnish him a safe place to work.

The employee refused to accept the amount of compensation allowed by the State Workmen's Compensation Act and sued his employer for damages.

The higher court held that the employee may accept compensation but could not sue his employer for damages. This court said: "Although there may be many cases in the future where injury and death from silicosis will be caused by the negligence of the employer, none of them will ever be able to recover damages therefor, even though no compensation is provided for such cases."

Scope of Employment

When the testimony proves that an employee sustained an injury within the

scope of his employment he can recover compensation under the State Workmen's Compensation Act.

For example, in *Harding Glass Company v. Davis,* 204 S. W. (2d) 880, it was shown that an employee of the Harding Glass Company reported an injury to a representative of his employer, who sent him to a clinic. A physician at the clinic examined him and told him he had a definite hernia, which would finally break through. The employee filed suit for compensation under the State Workmen's Compensation Act, saying that he sustained the injury while lifting glass. The higher court awarded compensation, saying that the testimony showed that the employee was injured "within the scope of his employment".

Zoning Ordinance Held Void

Considerable discussion has arisen from time to time over the legal question: When is a zoning ordinance valid? According to a recent higher court the authority of a city to impose limitations upon the use and employment of private property rests upon two sources: first, the police power to promote the safety, health, morals and general welfare of a community; second, the zoning provisions in the state constitution.

For illustration, in *Duffcon Concrete Products, Inc. v. Borough of Cresskill,* 58 Atl. (2d) 104, it was shown that a city passed an ordinance which restricted and prohibited within the city any building to be used for fabricating, manufacturing, converting, altering, finishing or assembling where mechanical power exceeding one horsepower electric motor is used. The Duffcon Concrete Products contested the validity of the ordinance.

The higher court promptly held the ordinance void, saying: "We do not understand that it is within the reach of the police power, either inherent or as enlarged by the constitutional zoning provision, for a municipality to restrict the use of private property to the end that a community may be isolated either socially or commercially from outside intercourse."

Rubber Cushions

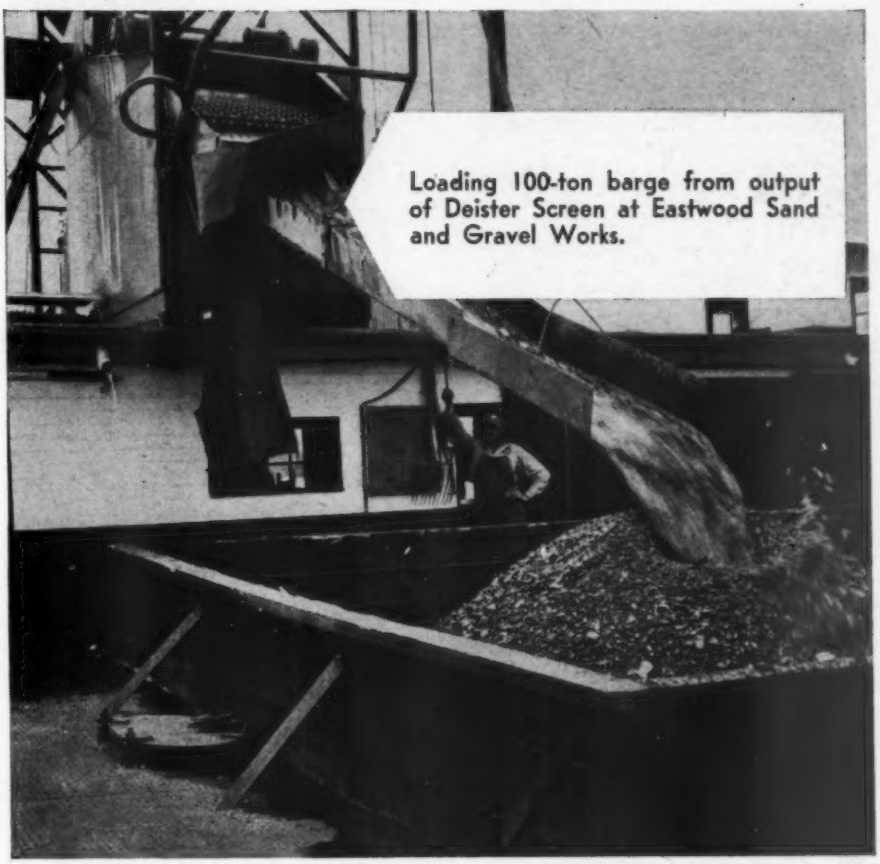
According to a recent higher court a noisy plant or factory may continue its operation although owners of nearby homes object to the noise, *if* the plant owner "uses care" to *reduce* vibrations and noises.

For example, in *Finn v. Pasquini,* 58 Atl. (2d) 199, certain home owners situated close to a concrete block factory filed suit and asked the court to grant an injunction prohibiting the operation of the plant because its machinery vibrated excessively.

The higher court held that the company could continue to operate the machines if they placed rubber cushions between vibrating metal parts of the machine.

Lease Contract

Very frequently buyers and sellers enter into "lease" contracts by the terms of which the purchaser may have legal title and ownership to the leased equipment by paying a nominal sum, as $1, after



Loading 100-ton barge from output of Deister Screen at Eastwood Sand and Gravel Works.

"Doing Everything Expected"

Handling the entire output of an 8" sand pump, a 4' x 8', two-deck Deister Screen is "doing everything expected" for the Eastwood Sand and Gravel Works, Grayville, Ill.

The Deister Screen, located on a pumping barge, screens and washes sand and gravel from the Wabash River bed at an output rate of 500 tons per day. R. M. Eastwood says his Company is "more than pleased with our Deister Screen. When we buy another screen it will be Deister."

Rugged construction, high capacity and smooth operation with no vibration transmitted to the supporting structure are reasons why Deister Screens are superior on jobs like this. Deister's flat screening angle, rapid conveying action, and uniform material distribution prevent accumulation of excess loads . . . enable Deister Screens to do "everything expected." For complete information, write for "Better Sizing Cheaper."

DEISTER SCREENS

DEISTER MACHINE CO.

FORT WAYNE 4, INDIANA

FOR DEPENDABLE PIPE LINES

You Can't Beat this NAYLOR Combination

Naylor lightweight pipe and Naylor Wedge-Lock couplings provide the practical answer for pipe lines in the mining field. This combination adds up to easier handling, time and labor saved on installation, savings in steel and high salvage and re-use value. Ideal for high or low pressure air and water lines. Sizes from 4 to 30 inches in diameter with all types of fittings, connections and fabrications.

Naylor

NAYLOR PIPE COMPANY

1237 East 92nd Street, Chicago 19, Illinois

New York Office

350 Madison Avenue, New York 17, N.Y.

the agreed rental payments are made in full.

A recent higher court held that such a contract is *not* a lease contract but a "sale" contract. Hence the parties to a contract of this nature are subject to exactly the same rights and liabilities as where they enter into ordinary sale contracts.

For illustration, in *Machinery Company v. International Development, Inc.*, 168 Pac. (2d) 37, the testimony showed that the International Development leased from a manufacturer a 100-horsepower diesel engine and a 100 kv.a. generator and exciter, together with a switchboard panel. The rental agreed to be paid was $3,500, plus sales tax of $105, of which $1,855 was payable at once, and the balance $1,750 in two monthly installments of $875 each, plus interest. The agreement also provided that upon payment of the rentals or installments International Development could purchase the equipment upon payment of $1.

After International had taken possession of the equipment it found that more than 30 parts were missing, and it was not put into operating condition until three months later, after International had expended $1,480.64 for repairs and parts.

In subsequent litigation the higher court held that the contract was *not* one of lease but a conditional sales contract. This court held that International could take full legal title to the equipment by paying the machinery company $303.48. This sum was arrived at by deducting $1,855 (originally paid on account) from the rental price of $3,605, leaving $1,750. From this amount the court authorized International to deduct the sum of $1,446.52, found to be the amount of the damages suffered by International by reason of the machinery company's breach of warranty, thus leaving a balance of $303.48 due the machinery company.

Corporation Fails to Sign Contract

Modern higher courts consistently hold that a corporation is *not* obligated on a contract which is not properly and legally authorized by its directors.

For example, in *Batt v. Michigan Trust Company*, 32 N. W. (2d) 18, it was shown that one Batt made a written agreement with stockholders of the Grand Rapids Gravel Company to buy 3,975 shares of the company's stock. However, the corporation's directors did *not sign* the contract.

Later Batt sued to compel the corporation to transfer the shares of stock. The higher court refused to do so, and said: "The Grand Rapids Gravel Company was not a party to the agreement and never have agreed to effectuate such a release."

Violated Law

Whenever an employee is injured while violating a valid law, he cannot receive compensation under the State Workmen's Compensation Act.

For illustration, in *Bogavich v. Westinghouse*, 57 Atl. (2d) 598, it was shown that an employee had in his pocket some

explosives, although a state law prohibits employees carrying explosives on their persons. A loud explosion was heard and dense blue smoke was seen to rise. Nearby workmen immediately went to the scene of the explosion. The employee was found face down on his right side upon the floor. He was dead. The left side of his body between the hip and the shoulder was entirely blown out; the body was eviscerated and the liver, kidney, heart and other organs were disrupted and torn. His dependents sued his employer for compensation under the State Workmen's Compensation Act. No testimony was given as to why the employee had explosives in his pocket, and the higher court refused to award compensation saying: "The board found that decedent by his possession of explosives violated the Federal Explosive Act. Violation of law amounts to an abandonment of employment and is a complete bar to compensation for resulting injury."

Attractive Danger

Generally speaking, property owners need take *no* precautions to safeguard trespassers against injuries, unless the trespassers are children. Under *all* circumstances, if owners of property have a danger, attractive to children, they *must do something* to safeguard children against injuries.

For example, in *Banker v. McLaughlin,* 208 S. W. (2d) 843, it was shown that a child met his death by drowning in a large gravel pit. The testimony showed that 50 families live in close proximity to the pit, whose owner took no precautions whatsoever to prevent children of immature years from playing about or swimming in the pit.

The lower court held the pit owner liable in $15,200 damages. The higher court approved the damage verdict and said: "The jury found not only that the pit, or pool, was attractive to children, but that it was dangerous . . . No warning sign or devices were placed in or near such pit to warn persons."

On the other hand, readers should realize that property owners are *not* bound to safeguard premises against *adult* trespassers. Nevertheless, the higher courts agree that a property owner is liable for injuries to trespassing children if: (a) the dangerous place was where the property owner should have known small children might play frequently; (b) property owner knew that the danger involved an unreasonable risk of death or serious bodily harm to such children; (c) the child, because of its tender years, did not realize the risk of going into the pool.

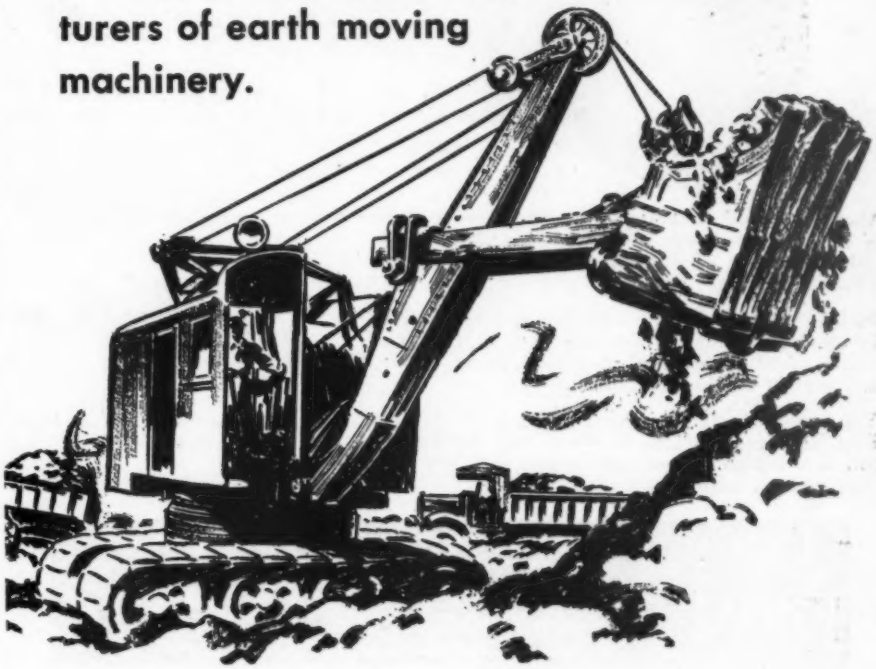
Picketing Enjoined

According to a recent higher court it is *unlawful* for a union to perform *any* act designed to cause the employer to force or induce employees to join a union.

In *Consumers Sand & Gravel Company v. Bldg. and Const. Trades Council,* 32 N. W. (2d) 531, the Consumers Sand and Gravel Company sued to enjoin a union from picketing its plant. The higher court held it unlawful for the union to picket the plant in order to

EASY TO WEAR-IN!

J-M INDUSTRIAL FRICTION MATERIALS wear well from the start . . . are specified as original equipment by most manufacturers of earth moving machinery.



HARD TO WEAR-OUT!

J-M INDUSTRIAL FRICTION MATERIALS wear slowly and evenly...are preferred by operators who keep maintenance costs low.

• J-M says "stop" and "go" to more tonnage than any other friction materials.

Replace with J-M Industrial Friction Materials and get better braking performance always. You're sure of long service, high braking efficiency and economical operation. Exceptionally durable, mechanically strong, J-M Friction Materials withstand faster speeds, heavier loads, harder shocks and higher temperatures. See your J-M Friction Material distributor or write Johns-Manville, Box 290, New York 16, N. Y.

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PYRASTEEL

S-E-G-M-E-N-T-A-L KILN ENDS

Easier to Install . . . Longer Service Life !

About 165 million barrels of cement—over 76% of the annual output—is produced in plants using either or both of our alloys, PYRASTEEL and EVANSTEEL.

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You can't beat this performance of PYRASTEEL Kiln Ends for avoiding burnouts and shutdowns, and insuring continuous production with low cost maintenance.

In the past 20 years over 1000 PYRASTEEL Kiln Ends have been installed. Some have lasted for 14 years without a failure—6 to 8 years' service is quite common.

Unit Segments are easy to install or replace.

Write for PYRASTEEL Bulletin

CHICAGO STEEL FOUNDRY COMPANY

PYRASTEEL for high temperatures

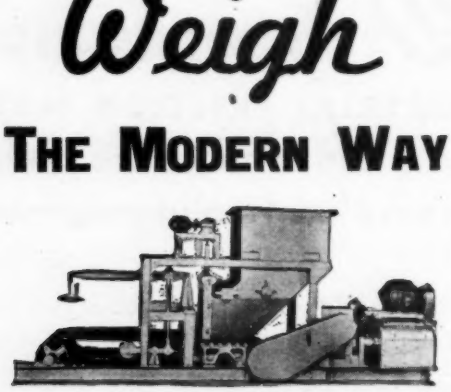
KEDZIE AVE & 37TH ST.
CHICAGO 32, ILL.
Makers of Alloy Steel for 35 Years

EVANSTEEL for strength

OUTPUT

Weigh

THE MODERN WAY



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have an overall efficiency that makes them always "at home" in the plants of profit minded producers.

For speed, precision, automatic operation, and high economy you can't beat Poidometers in the many phases of material handling and processing—weighing, blending, feeding, mixing, recording and proportioning.

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Write for Catalog No. 5

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2828 Smallman Ave., Pittsburgh 22, Pa.

COSTS

compel the company to sign a closed shop agreement where the plant employees were opposed to joining a union. The company's unionized truck driver refused to cross picket lines. The court held that this was an "unfair labor practice" and enjoinable. The court said: "We think the purpose of the picketing in this case was to coerce the employer to bring pressure upon his employees to join a union."

Public Street Not Implied

Under no circumstances will a court *imply* that a street or other public passageway is in a location *not* shown on a plat of the subdivision.

For example, in *Dziedzic v. Kaplan Concrete Block Company,* 57 Atl. (2d) 839, a property owner named Dziedzic sued to stop the Kaplan Concrete Block Company from proceeding with erection of a concrete block building, and to compel it to remove the portion already erected, on the ground that the building constituted an encroachment upon an easement existing by virtue of the deed of the land and according to a plan laying out the land into streets. The counsel for the concrete block company proved that *no positive* street was shown on the plat.

Therefore, the higher court refused to hold in favor of Dziedzic, saying: "No persuasive reason exists to warrant implication of an intention to extend the lines shown on the plan."

Not Within Scope

It is well established law that dependents of an employee who dies while at his regular work *cannot* receive compensation under the State Workmen's Compensation Act, if the death was not caused by something connected with his work.

In *Andino v. Donovan,* 76 Fed. Supp. 228, it was shown that an employee was standing in a quarry barring loose stones from the face of the quarry with an iron bar when he collapsed and the bar slipped from his hands. He died two hours later.

The testimony showed that the employee died from coronary thrombosis and that he had suffered from heart ailment for many years.

The higher court held that the employee did not sustain an injury "arising out of and in the course of his employment" and therefore refused to award compensation to the wife of the deceased employe.

Must Promptly Complain

It is well established law that a contractor who is dissatisfied with *not* being awarded a contract on which he submitted a bid must promptly complain or he cannot expect a favorable verdict.

For example, in *Saunders v. Board of Education of Van Buren Tp.,* 59 N. E. (2d) 936, it was shown that a township board of education let a contract to a contractor whose bid for labor and material was $10,425. This bid was only $54 less than a bid submitted by another contractor named Saunders.

Saunders waited 7 weeks after the first contractor started the job and then filed

suit to invalidate the contract. The higher court refused to hold in favor of Saunders, saying: "As a private bidder he (Saunders) had full knowledge of the fact that the contract was let to another bidder, but still waited for a period of seven weeks during which time the successful bidder began the erection of the improvement and expended large sums in the prosecution of the work."

United States Damages Road

According to a recent higher court the owner of a private road can recover *adequate* and reasonable damages from the United States or other user which used the road to haul sand and gravel.

In *United States v. Gallagher,* 166 Fed. (2d) 841, it was shown that the United States hauled 66,000 yards of sand and gravel over a private road, thereby seriously damaging it.

The higher court held that the owner of this private road could recover from the United States an amount equal to the cost of putting the road in its former good condition, or the United States must pay the actual value of the private road *before* it was damaged.

No License Needed

It is true that a salesman who sells or leases real estate without a license cannot sue and recover a commission. However, this law is *not* applicable where a salesman or person gives a prospect information which enables him to purchase property.

For example, in *Waco-Tex Materials Company v. Lee,* 210 S. W. (2d) 886, it was shown that Waco-Tex Materials Company verbally agreed to pay one Lee two cents per cubic yard for gravel and four and one-half cents per cubic yard for all sand removed by the company from any gravel or sand deposits pointed out by Lee and on which the company was successful in obtaining leases.

In subsequent litigation the Waco-Tex Materials Company contended it was not obligated to pay Lee because the latter had no real estate broker's or salesman's license.

The higher court held that Waco-Tex Materials Company must pay Lee two cents per cubic yard on gravel and four and one-half cents on sand removed from land which Lee discovered, pointed out to Waco-Tex Materials Company and on which Waco-Tex Materials Company got a lease, although Lee was not a licensed real estate dealer.

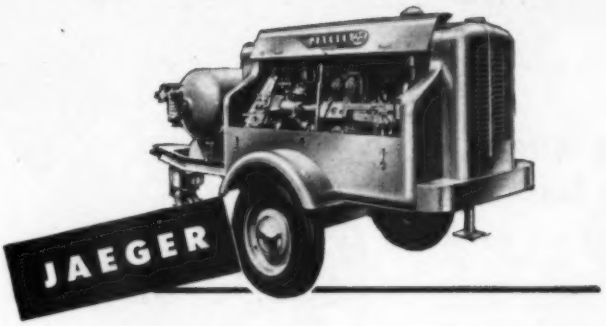
Wall Falls

The higher courts consistently hold that a person or company causing damage *without* negligence to another, is *not* liable in legal damages.

For example, in *Carothers v. Olshan,* 198 S. W. (2d) 941, it was shown that a building adjoining a park lot and garage was gutted by fire. A company, when tearing down the building, caused a wall to fall, causing considerable damage. The higher court refused to hold the wrecking company liable in damages to the property owner, and said: "That the wall here would fall was obviously not an unexpected happening. . . . Appellee (wrecking company) and his employees were guilty of no negligence."

MORE AIR
TO RUN MORE TOOLS

with JAEGER "NEW STANDARD" SIZES



75 cfm — instead of 60
125 cfm — instead of 105
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New Standard 125 ft. "Air Plus" can run 2 big breakers, or 3 medium breakers, 4 clay spades or 2 heavy sheeting drivers at full 90 lbs. pressure — do 30% to 40% more work than the same tools under mere 70 lbs. pressure.

Costs no more than inefficient "single breaker" 105 ft. compressors and uses no more fuel when not delivering more air.

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See Pit and Quarry September 1948 issue for article describing this plant.

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NO SAG NO PULL OUT

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• Increase your profits and stop tonnage losses with the specially prepared, reinforced screen sections for vibrators. This standard type of edge is available in five different styles for electrical and mechanical vibrating machines.

Let our wire screen specialist show you how you can adapt these screen section assemblies to increase your profits.

There is a CLEVELAND Wire Screen for every purpose.

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- EASY TO CHANGE
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When sizing goes down to agstone—efficiency stays *up*—with an American Hammermill. These new American ACS Hammermills are designed with a special center feed, to lengthen the travel of the stone—and assure a higher ratio of fines. Quickly and easily adjusted to different sizing, Americans can add great flexibility and increase output on any size of operation.

Americans are Custom-Built!
Three types of hammers offer a flexibility of crushing action to meet every need—and the number of hammer rows can be fitted to your specific reduction operation.

A. "Brute", for heavy duty.
B. "Broadhead", for medium reduction.
C. "Splitter", for fine reduction.

For further information, write for your copy of "Better Stone Crushing".

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Originators and Manufacturers of Ring Crushers and Pulverizers
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St. Louis 10, Mo.

Questions and Answers

LEGAL EDITOR, PIT AND QUARRY: We have been reading your legal editorials and are very much interested in them. We have a case we would like to have your opinion on. We leased a farm to strip coal on containing 160 acres. There was a right of way across this farm to lay a pipe line 30 inches below the surface on a strip of ground 3 feet wide and 1,235 feet long.

We started stripping off the right of way and the gas company served an injunction on us and stopped our equipment from operating about 200 feet from their right of way and ordered us not to operate any place on this farm.

(1) Can the court give anyone a right for a period longer than 21 years to maintain a pipe line? (2) Can the company legally sell this right or license to lay their pipe on this land to another company? This was done twice in this case, and the name was also changed. (3) It is common practice of utility companies to cut timber free of charge so the property owner can get it without damaging their lines. Could the gas company be compelled to do this with a coal stripping operation? (4) The property owner pays the taxes on all this land. Would the gas company have to pay for the lost time of this equipment, which was quite a distance from the right of way and was not damaging it? Liberty Stone Products Company.

Answer: (1) Yes, eminent domain or appropriation gives the gas company indefinite ownership to the strip of land. (2) Yes. (3) No. The fact that the gas company cuts wood free does not compel it to do anything else free. As a matter of fact this free work is for the benefit of the gas company to protect its lines. (4) Not unless the higher court decides that the gas company is in the wrong. This is so because such an injunction is granted for protection of the general public, as well as to keep the gas lines in operation for the distribution of gas.

Sales of Calcium Chloride Hit Record High in 1947

Sales of natural calcium (and calcium-magnesium) chloride set a new record in 1947 of 271,206 short tons, an increase of 3 percent over 1946, according to reports of producers to the U. S. Bureau of Mines. The main use of calcium chloride is in road stabilization. Other important uses include ice and dust control, and curing of concrete.

The following firms reported production of calcium chloride (and calcium-magnesium chloride) from natural brines in 1947: California Rock Salt Co., Los Angeles; Dow Chemical Co., Midland, Mich.; Hill Brothers Chemical Co., Los Angeles; Michigan Chemical Corp., St. Louis, Mich.; National Chloride Co., Amboy, Calif.; Rademaker Chemical Corp., Eastlake, Mich.; Desert Properties Co. (Frank Thomas, receiver), San Bernardino, Calif.; and Westvaco Chemical Corp., South Charleston, W. Va.

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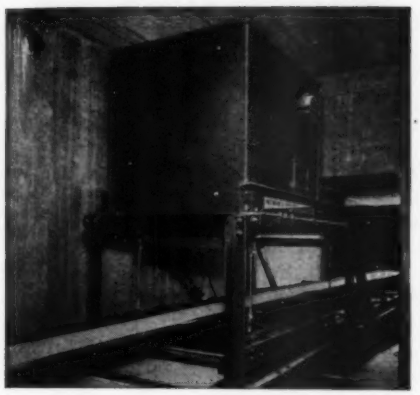
√ Automatically . . . . .

√ Accurately . . . . . .

√ Economically . . . . .

with the MERRICK

WEIGHTOMETER



This is the modern, time-proven method of continuous weighing and recording of raw materials handled by belt conveyors. For precision and economy, specify MERRICK Weightometers in your production line. Write for Catalog.

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Shovel Dippers
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Ball Mill Liners
Screen Plates

The Frog, Switch & Mfg. Co. CARLISLE, PA.

ESTABLISHED 1881

STATEMENT OF OWNERSHIP

Statement of the ownership, management, circulation, etc., required by the Acts of Congress of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946, of PIT AND QUARRY, published monthly at Chicago, Illinois, for October 1, 1948.

State of Illinois, County of Cook, *ss.*

Before me, a notary public in and for the state and county aforesaid, personally appeared James E. Montgomery, who, having been duly sworn according to law, deposes and says that he is the business manager of PIT AND QUARRY, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily, weekly, semi-weekly or tri-weekly newspaper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the act of August 24, 1912, as amended by the act of March 3, 1933, and July 2, 1946, (section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit):

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Complete Service Publishing Company, Chicago, Ill.; Editor, Walter E. Trauffer, same; Managing Editor, Walter E. Trauffer, same; Business Manager, James E. Montgomery, same.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address as well as those of each individual member, must be given).

Complete Service Publishing Company, Chicago, Ill.
Harry W. Baumgartner, same.
Ida A. Baumgartner, same.
James E. Montgomery, same.
Evelyn W. Montgomery, same.
Stanley A. Phillips, Evanston, Ill.
Florence S. Phillips, same.
Ray L. Smith, Jr., Glen Ellyn, Ill.
Lanetta B. Smith, same.
W. T. Klussman, Brookfield, Ill.
William T. Klussman and Lanetta B. Smith, Trustees of Bernice Joan Smith, Trust No. 1, Chicago, Ill.
William T. Klussman and Lanetta B. Smith, Trustees of Harry William Smith, Trust No. 1, same.
William T. Klussman and Lanetta B. Smith, Trustees of Ray Light Smith, 3rd, Trust No. 1, same.
William T. Klussman and Lanetta B. Smith, Trustees of Stephen Howard Smith, Trust No. 1, same.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 percent, or more of the total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is.....(This information is required from daily, weekly, semi-weekly and tri-weekly newspapers only.)

JAMES E. MONTGOMERY,
Business Manager.

Sworn to and subscribed before me this 15th day of September, 1948.

(SEAL) FRANK J. CORNYN.

(My commission expires Sept. 5, 1950.)

Lime-Sand Company of England will construct a new plant in Toronto, Ont., for the production of ready-mixed mortar. The initial production will be approximately 300 tons per day and will be increased rapidly to a full capacity of 1,000 tons.

WE WILL LET YOU WRITE YOUR OWN GUARANTEE

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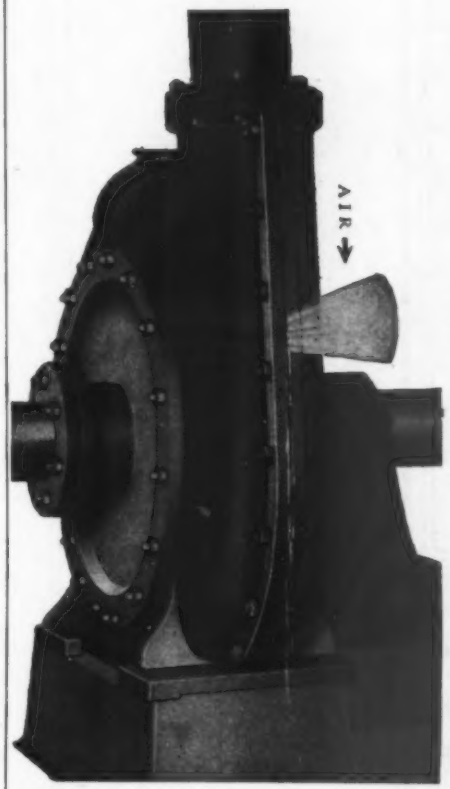

HERE'S HOW AND WHY—

A length of flax packing is clamped between the halves of the split "Tell-Tale" Pump Shell to form an air-tight joint between the Shell and its Renewable Inner Lining.

When the abrasive action of the sand and gravel, or other materials being pumped, finally cuts thru the tough Shell Liner, (and a few minutes later thru the flax packing) air will be sucked into the nearest port hole in the Shell. (What appears in the picture above to be a spray of water spurting out of the Shell is the artist's conception of air being sucked into it.) This causes the pump to lose its prime and immediately stop pumping materials. It also serves as a warning to the operator that the Shell Liner has worn out.

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traffic news

CENTRAL FREIGHT ASSOCIATION DOCKET

Docket 86016—It is proposed to establish on limestone, agricultural, unburned, in bulk, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply:

	Cents per net ton
From Georgia, Ind.	
To Beardstown, Ill.	127
Philadelphia, Ill.	121
Ridgway, Ill.	110
Springer, Ill.	99
Sharpsburg, Shawneetown, Ill.	116

Docket 86024 (2)—Establish on crushed stone, in bulk, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded, etc.

	Cents per net ton
From Russellville, Ind.	
To Metcalf, Carmargo, McCowan, Hume, Newman, Murdock, Ficklin, Tuscola, Garrett, Atwood, Pierson, Hammond, Burrowsville, Lintner, LaPlace, Casner, Long Creek and Decatur, Ill.	123

(Not subject to tariffs X-162-A and X-166-B.)

CENTRAL FREIGHT ASSOCIATION DOCKET

Docket 86039—It is proposed to establish on crushed stone or stone screenings in open-top cars, straight or mixed, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Milltown, Ind., to Booneville, Ind., 137 cents net ton, not subject to increases under ExParte 162 or 166.

Docket 86049 — Establish on stone crushed, in bulk, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when cars are loaded to full cubical or visible capacity, actual weight will apply from Speed, Ind., to Booneville, Ind., 112 cents net ton.

Docket 86054—Establish on stone fluxing, furnace or foundry, melting or refractory (unburned) in bulk, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Durbin, O., to Ashland, Ky., 102 cents per gross ton.

Sprague & Henwood
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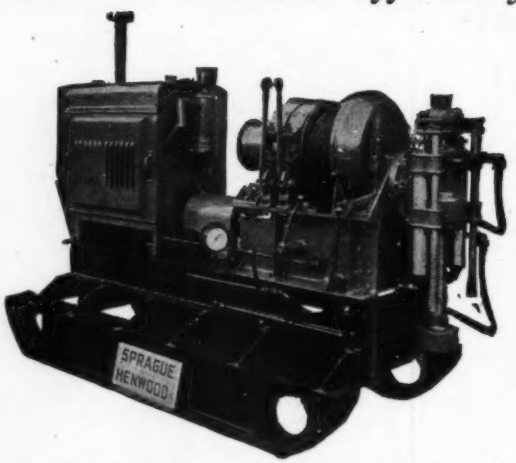
For EXTRA Efficiency



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These high-speed, sturdy units back up the drill bit with ample, sustained, economical power.

Available in two types of feed, as desired. "Screwfeed" and "Hydraulic." Hydraulic swivel head can be furnished for either water or oil operation. Write for Details.

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Drill Down Fast
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Bortz DIAMOND BITS

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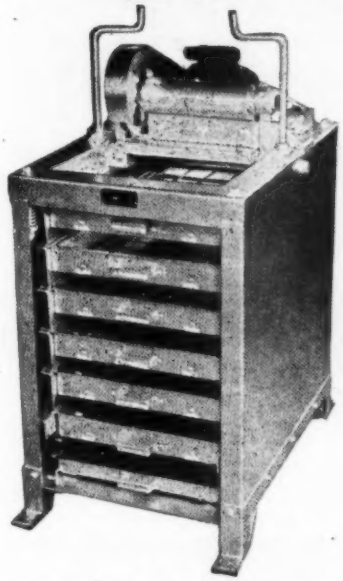
ELIMINATES ERROR from testing procedures



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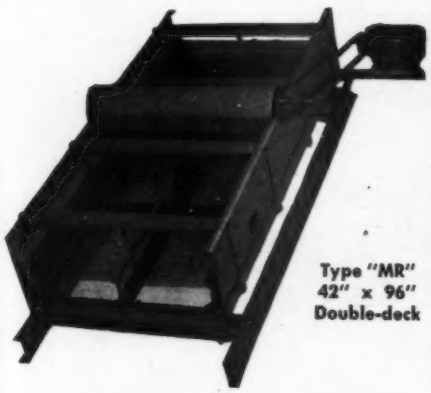
Vibrating Screens

Rugged, efficient and economical, they're your best bet for satisfactory screening!



Type "MR" 42" x 96" Double-deck

Get acquainted with their design and advantages. Write today for catalog No. 107 on Screens and Screening!

UNIVERSAL VIBRATING SCREEN CO.
RACINE - - WISCONSIN

CENTRAL FREIGHT ASSOCIATION DOCKET

Docket 86215—Proposed to establish on agricultural limestone, unburned, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from West Columbus, O., to Grafton, O., 127 cents net ton.

Docket 86220 (2)—Establish on sand and gravel (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, moulding and silica), stone, crushed, carload in open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity actual weight will apply, from Kenneth and Logansport, Ind., to Merrillville, Ind., 110 cents net ton.

ILLINOIS FREIGHT ASSOCIATION DOCKET

Docket IRC-511-755—Crushed stone, carload, as described in I.C. Railroad Tariff 13321-I, I.C.C. A-11296, from Ullin, Ill., to L. & N. Railroad stations in Illinois to (representative) points:

Woodlawn, Ill., Mt. Vernon, Ill.	116
McLeansboro, Ill.	124
Carmi, Ill.	130
Lawley, Ill.	120

Rates subject to X-162-166 increases. Present: Class or combination.

Docket IRC-511-758—Limestone, agricultural, ground or pulverized (having value for purpose of soil treatment), carload, in bulk in open-top equipment, minimum weight marked capacity of car but not less than 80,000 pounds, except that when car is loaded to capacity, actual weight will apply, from Cannon, Mo., to Whitehall, Wrights, Greenfield, and Rockbridge, Ill. Present, 77; proposed, 70; to Kemper, Medora, Piasa, and Brighton, Ill. Present, 66; proposed, 50. Rates subject to X-162-A and X-166-B increases.

NEW ENGLAND FREIGHT ASSOCIATION DOCKET

Docket 71906—It is proposed to establish a commodity rate on crushed stone, in bulk, in open-top cars, minimum weight 90 percent of marked capacity of car, except that when cars are loaded to full cubical or visible capacity, actual weight will apply, from Greenfield, Mass., to Springfield, Vt. Present, $3.09 per net ton; proposed, $1.70 net ton. Present proposed rates include ExParte 162-A and 166-B increases. Reason: Establish rate which will enable rail carriers to receive a road haul on this traffic.

DOCKET AND STATUS REPORT OF PRIOR SOUTHERN FREIGHT ASSOCIATION SUBMITTALS

Docket 40418—Establish rates on crushed stone, carload in cents per ton of 2,000 pounds from Ripplemeade, Va., to Rocky Mount, Va., 95; and Martinsville, Va., 105. Not subject to X-162. Rates will be observed as maxima at intermediate points.

SOUTHWESTERN FREIGHT BUREAU DOCKET

Docket 45948—It is proposed to establish a rate of $5.34 per net ton on limestone, ground or pulverized, unburned, carload, minimum weight 60,000 pounds from Gibsonburg, Maple Grove, O., and other northwestern Ohio group 1 points to Shreveport, La.

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LUBRIPLATE Lubricants are a paradox. They not only possess enormous film strength to withstand the heaviest loads but they function with minimum drag, hence conserve power. The "stay-put" quality of these unique lubricants means less frequent application and less lubricant consumption. Yes, they are most economical too. Write for particulars.

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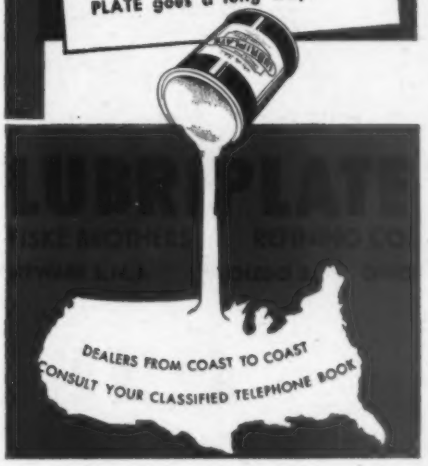
Lubricants definitely reduce friction and wear to a minimum. They lower power costs and prolong the life of equipment to an infinitely greater degree. LUBRIPLATE arrests progressive wear.

LUBRIPLATE

Lubricants protect machine parts against the destructive action of rust and corrosion. This feature alone puts LUBRIPLATE far out in front of conventional lubricants.

LUBRIPLATE

Lubricants are extremely economical for reason that they possess very long life and "stay-put" properties. A little LUBRIPLATE goes a long way.

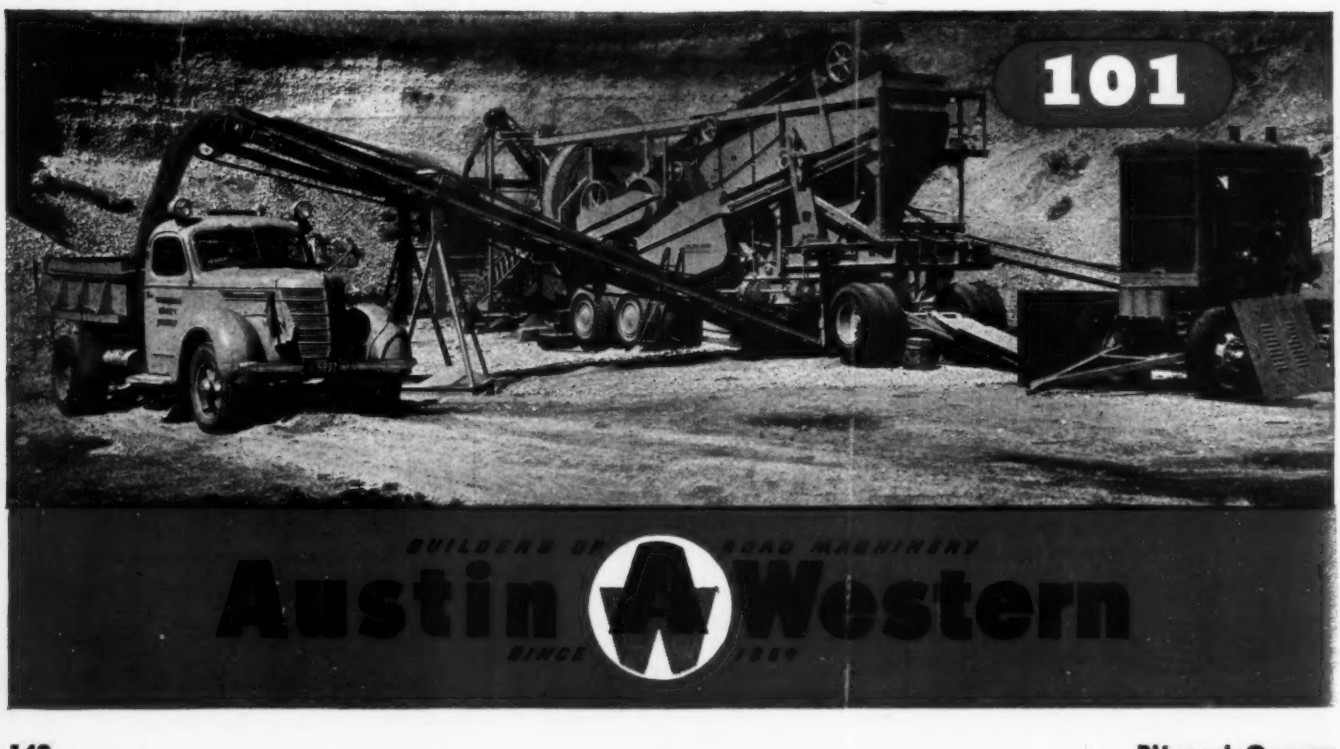


1036
3018
4X12
30
7 Tons Per Minute

The secret of the tremendous production of the "101" Portable Crushing and Screening Plant lies in the high operating speeds of its 1036 jaw crusher and 3018 roll crusher; and in a completely balanced design which provides unusually wide (30″) feed and delivery conveyors, and an unusually large (4′ x 12′) vibrating screen of the highly efficient, positive-throw type. Thus, there are no bottlenecks to retard the flow of material through the closed circuit. Production figures naturally vary with local conditions, and with the size of finished product, but many owners report production well in excess of 7 tons per minute.

Your nearby A-W Distributor will be glad to tell you the whole story of the magnificent "101," leader of a complete line of portable and stationary, gravel and rock plants; each designed to do a particular job with maximum efficiency.

AUSTIN-WESTERN COMPANY • AURORA, ILLINOIS, U. S. A.



NEWS OF CONCRETE MANUFACTURERS

Block Output at Texcrete's $75,000 Plant to Reach 1,000 Units per Hour

Completion of the new $75,000 plant of the Texcrete Company at Dallas, Tex., is expected in the immediate future, and production of haydite block at the rate of 1,000 per hour will begin as soon as all installations have been made.

The plant is built of haydite Texcrete block and is located on a site purchased from the Texas Lightweight Aggregate Company, which had originally planned to erect a plant on it. Texcrete was organized at Fort Worth in 1946. Officers include the following: James H. Snowdon, president; George A. Meihans, executive vice-president; Elmer Lockwood, secretary-treasurer; and Frank Locke, vice-president. Mr. Locke will be the general manager of the Dallas plant.

Block produced by Texcrete is made from lightweight aggregate mixed and processed by the Texas Lightweight Aggregate Company at Eastland, Tex. Units are made in 4-in. modular increments in more than 40 shapes. The new plant will be equipped with Besser Vibrapac machines.

Kyle and Larsen Announce Big Bartile Plant at Portland

One of the largest Bartile plants in production, to be devoted exclusively to the manufacture of these patented concrete roofing tiles, has been announced by H. A. Kyle and Soren Larsen.

The concern, to be known as the Oregon Bartile Co., is erecting a $70,000 plant in Portland, Ore., in which a battery of eight Bartile machines will shortly go into service, with eight more to be added later. Ultimately the plant will be capable of producing enough units to roof eight to ten average houses per day.

The plant was designed by the architectural firm of Lathrop & Gillam of Portland. The initial payroll will include 14 workmen.

The equipment, manufactured and sold by the E. F. Barber Co., Bloomington, Calif., is being installed under the direction of W. L. Hogan, sales engineer with the Barber organization.

Plans for Concrete Institute Convention Nearly Completed

Confirmation of the dates for the 45th annual convention of the American Concrete Institute has been made—February 22-25, 1949. Convention headquarters will be at the Hotel Pennsylvania.

Although the program has not been fully outlined, a few topics to be covered have been indicated. It is probable that one entire session will be devoted to concrete pavement problems. Another cautiously-worded comment is that concerning the structural design session—"Some of the principal elements of a session . . . are fairly well determined." There will be the usual annual open session of the research committee and two other general sessions.

Cement Shortage Blamed for Industrial Slump in Canada

"You simply can't buy cement today, and because of that we are closed right up," said a spokesman for Canada Block and Tile Co. Ltd. "We haven't made a block for two weeks or more. We can't even get Canadian cement. For a while we were getting American cement, but we can't even get that now. The cement manufacturing companies say that the new Hydro projects are taking a lot.

"Canadian cement has risen in the last few months from 75 cents to 90 cents a bag, and American cement, which has six more pounds in a bag, has risen from $1.13 to about $1.90.

"Cement which sold for 95 cents a bag a month ago now sells at $1.75," a contractor stated. "We get both American and Canadian cement to fill our needs, but the price has jumped. All contractors have to grapple with a cement shortage. Like any other commodity in short supply, this means waiting for quotas, with resulting delays in construction."

Dale Seeber of Hillsboro, Ore., has received a patent for precast sectional concrete steps and has announced plans to manufacture them in a variety of sizes. The steps, which are designed with safety features for home and industrial use, were exhibited at the Oregon state fair.

Coming Events

January 31-February 3, 1949—Cleveland. Annual convention and exposition, National Concrete Masonry Association, Cleveland Auditorium.

February 14-18, 1949—New York. 19th annual convention, National Ready Mixed Concrete Association, Hotel New Yorker.

February 22-25, 1949—New York. 45th annual convention, The American Concrete Institute, Hotel Pennsylvania.

Alvin W. Hicks Appointed St. Louis Sales Manager For Marquette Cement

Alvin W. Hicks has been appointed sales manager in the St. Louis office of Marquette Cement Manufacturing Company. From offices in the Shell Building, St. Louis, he will have charge of Marquette sales in Missouri, southern Illinois and southern Indiana. Prior to his promotion Mr. Hicks had been service engineer and assisted the sales manager in Marquette's Memphis office.

Alvin W. Hicks

A member of the American Society of Civil Engineers and of the American Concrete Institute, Mr. Hicks is a concrete specialist of wide experience. He received his engineering training at the University of Texas and subsequently was employed in the engineering divisions of the Missouri Pacific Railroad, Arkansas State Highway Department, U. S. Engineers, and Black & Veatch, architects, of Kansas City, Missouri.

Ready-Mixed Concrete Plant Opened in Jeffersonville, Ind.

Jeffersonville, Ind., has a new industry, the New Albany Ready-Mix Concrete Company, which recently opened a plant under the supervision of Shay Zenor, who is vice-president and general manager.

The new facilities, fully automatic, were built by the New Albany firm at Jeffersonville to meet the rising demand in that area.

Anchor Concrete Products Sets High Production Goal For 1948—5,000,000 Units

Critical as the concrete block shortage is in Buffalo, it would be considerably worse were it not for the soaring production of Anchor Concrete Products, Inc., in Cheektowaga.

This company, which started only 12 years ago at 1375 William St., shifted operations last year to a new $500,000 factory near Harlem Rd. and Williams St. Its production today, according to President Frederick W. Reinhold, is greater than that of any single concrete block plant in the state.

Anchor's output in 1945 was 1,250,000 units. In 1946 it rose to 2,250,000 units, and in 1947, it hit the 4,000,000 mark. This year's estimated output will approximate 5,000,000 units.

California Masonry Producers' Dinner-Meeting Well Attended

About 50 members and guests of the Concrete Masonry Manufacturers' Assn. of Southern California gathered for a dinner meeting of the organization on September 28 in the Green Room of Rodger Young Auditorium in Los Angeles.

Jack Allen (Hollostone Co., North Hollywood), association president for 1948, served as chairman.

Saul Brown, architect and head of the firm of Brown & Treadway, Los Angeles, described the improved plan service and proposed distribution among the membership of his enlarged edition of "California Houses of Concrete Block."

George Shaw of Superior Construction Company outlined the methods he is using in his brick- and block-masons' training school in Los Angeles, whereby acceptable workmen are being turned out after an intensive 90-day training period to combat the shortage of workers in this craft.

Representatives of the Frederick O'Brien Company and the Dow Corning Corporation explained "Sil-O-Seal," a product which has been hailed as a most effective concrete-masonry waterproofer. "Sil-O-Seal" is attracting much attention in the industry.

Thomas W. Noble Award Winner to Be Announced

Some employee of a member-company of the National Concrete Masonry Association soon will receive a check for $500. He will be the winner of the Thomas W. Noble Award for 1948.

The purpose of the award is to stimulate the thinking of plant and office employees and to inspire them to do an all-round better job. To be eligible for the award, the suggestion or idea must be submitted in writing and mailed to the N.C.M.A. not later than December 1, 1948. The ideas submitted may pertain to any phase of the industry: e.g., improvements to plant machinery, improving the process of manufacturing, merchandising or marketing methods, promotion of new uses for concrete masonry products, or the development of any idea or process which will benefit the concrete masonry industry.

Only regular N.C.M.A. members—either owners, co-owners, or any one employee or any group of their employees—are eligible for this award. The winner of the award will be announced during the N.C.M.A. annual meeting in Cleveland, O., Jan. 31-Feb. 3, 1949.

Roy Darden Industries Moves to New Site—Adds Shuptrine to Staff

An announcement received from Roy Darden Industries, Inc., states that the company has moved its facilities to a suburban location on Old Peachtree Road north of Atlanta, Ga. The main office, the warehouse and the demonstration plant will be on the same site.

A newcomer on the Darden staff is Harold Shuptrine, who is known throughout the South as a successful block plant

Harold Shuptrine

Roy Darden

operator. He has had extensive experience in installation work.

It was revealed that the firm has been awarded the distribution of the F and A Precast Concrete Floor and Roof System, developed by M. A. Arnold (Arnold Stone Co., Greensboro, N. C.), Otto Formigli (Formigli Bros., Inc., Philadelphia, Pa.) and J. W. Warren (Southern Cast Stone Co., Knoxville, Tenn.). This system employs the use of lightweight precast inverted T joists and filler block, made on high production machines. It eliminates the use of all forms in floor and ceiling construction.

Lloyd Tanner and Paul Jones, former owners of the Paxton Concrete Company at Paxton, Ill., have announced the sale of their business to John F. Koester of Cissna Park, Ill.

• Members of the Concrete Masonry Manufacturers Assn. of Southern California make sure their products are of highest quality by frequent tests performed by Triplett-Barton, Inc., at its Los Angeles laboratories. Distant members get the same speedy service as do those in Los Angeles. The company's own airplane picks up test samples regularly. Shown in the illustration is the Triplett-Barton plane at the Kern County Airport at Bakersfield, Calif., ready to whisk a couple of dozen units back to Los Angeles. Left to right: Tom Triplett; Vern Gray (Permatile Concrete Products Co.); Chas. Fewell (Fewell Concrete Products Co.); and Robert Sweitzer (Concrete Products & Equipment Co.), all of Bakersfield.

W. H. McDowell Retires—Layden, Gaunt Promoted By Universal Atlas Cement

W. H. McDowell

Winfield H. McDowell, for the past 14 years sales manager of the Kansas City territory of Universal Atlas Cement Company, subsidiary of United States Steel Corporation, retired after 37 years of service with the firm. Appointed to succeed Mr. McDowell is Harold J. Layden, who has been the cement company's district sales manager at St. Louis.

Mr. Layden, successor to Mr. McDowell, joined Universal Atlas in 1926 as salesman at the Chicago office. In 1935 he was transferred to the cement company's Kansas City office where he

H. J. Layden

W. T. Gaunt

continued as salesman until 1940. In that year Mr. Layden became a salesman at the St. Louis office of Universal Atlas, and on January 1, 1945, he was appointed district sales manager.

Succeeding Mr. Layden at St. Louis is W. Troy Gaunt. Continuously active in sales work in the company's Kansas City and St. Louis territories, Mr. Gaunt has had almost a quarter-century of experience in the field of cement and concrete uses.

Volume of Pipe Output High Despite Continued Shortages

Concrete pipe is being produced in greater quantities than ever before, according to J. A. Dunn, president of the American Concrete Pipe Association.

Even though the industry expects to surpass its 1947 production of approximately six millions tons of concrete pipe, most plants are not working at maximum capacity, Mr. Dunn added. Shortages of steel for reinforcing purposes and inability to secure adequate stocks of cement are the reasons. "That is why some contractors and users of concrete pipe may have a short wait before delivery," said Mr. Dunn.

"We have every assurance from cement plants and the reinforcing steel industry that materials essential to the manufacture of top quality concrete pipe will be supplied us as speedily as possible. Meanwhile, the exceptional demand for cement is expected to ease up with the advent of winter weather, thus making more of it available for concrete pipe manufacturers."

In addition to heading the A.C.P.A., Mr. Dunn is president of Hume Pipe of New England, Inc., Swampscott, Mass.

DeVries Modernizes Plant To Meet Big Local Demand

Established by E. DeVries 31 years ago in Grand Rapids, Mich., the masonry block company of E. DeVries & Sons has found the expansion of its facilities imperative to meet the soaring demand for its products. During the last two years many innovations have been made to modernize and improve the plant. Two new Stearns Joltcrete machines have replaced the old block machines, quadrupling output and producing better units. Equipment will also be added for making precast lintels.

Mr. DeVries says that it is a far cry from the early days in 1917, when one man turned out 200 concrete blocks per day with a hand machine, to 1948, the day of automatic equipment capable of producing 7,000 units.

Today Mr. DeVries's sons, Nick, Reinhard, Bert and Richard—all World War II veterans—are associated with their father in the business. Although standard concrete blocks are still made, lightweight cinder blocks account for 90 percent of the plant's output.

Southeastern Producers To Meet at Miami Beach—N.C.M.A. Members Invited

For several years producers of concrete masonry units located in the Southeastern section of the country have been holding a regional meeting for the purpose of becoming better acquainted and for the discussion of problems of common interest. The first of these meetings held at Knoxville, Tenn., was followed by a meeting at Birmingham, Ala., and last year in New Orleans. The next meeting will be held at Miami Beach, Fla., on November 8-10. Headquarters will be the Hotel Richter.

It has been the practice of the local committee in charge of arrangements to circulate invitations only to producers located within the Southeastern area. Because of the location of the meeting this year, however, and the expressed interest of N.C.M.A. members in other sections indicating a desire to attend the Southeastern meeting, the local committee has requested that the entire membership of the N.C.M.A. be invited to attend these meetings.

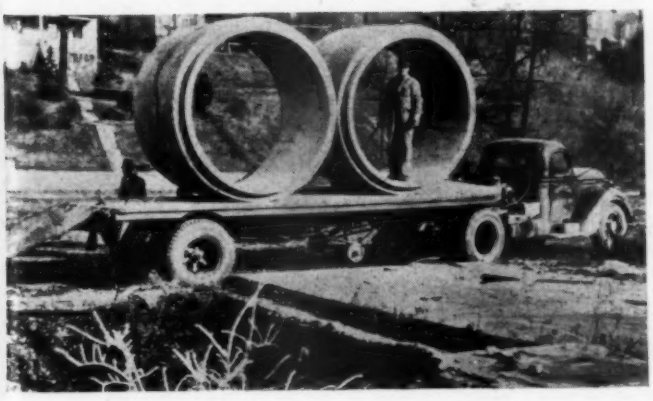
Scale Model Fork Lift-Truck Available for Plant Planning

Towmotor Corporation, manufacturer of fork lift-trucks, tractors, and accessories, is offering assistance, in the form of an accurately designed, quarter-inch scale model fork lift-truck, to plant engineers and other executives interested in formulating efficient factory layout plans. The realistic miniature Towmotor fork lift-trucks are easily moved about, rolling freely on tiny scale-size wheels and can even carry scale model loads on the forks.

The increased use of scale model buildings, machinery and other production equipment for plant and office layout work has resulted in considerable savings.

The scale model Towmotor fork lift-truck is available to plant management men at a cost of $1.50 each. Requests for models should be addressed to Towmotor Corporation, 1226 East 152nd St., Cleveland 10, O.

These huge 84-in. pipe sections, manufactured by Universal Concrete Pipe Company, were recently installed on the Slago Run city sewer project at Zanesville, O., by the Adams Bros. Contracting Co. In the picture at the left preparations were being made to lower the pipe. H. S. Rood, driver of the Columbus, O., plant, stands inside one of the sections. In the illustration at the right three workmen are shown preparing the sub-grade for the next joint of pipe, which is 5 feet long and weighs 11,500 pounds.



New Plain Pallet Machine Maintains High Production at Chattanooga Plant

another ON THE SPOT report

THE first model of the Warren "800" block machine, manufactured by Link-Belt Co. for Roy Darden Industries, has been in continuous service for almost two years at the plant of Hamilton Concrete Products Co., Chattanooga, Tenn. Rated at 800 standard 8-in. units, or almost 10,000 bricks, per hour, the machine is a fully automatic, plain-pallet model which pro-

By WILLIAM M. AVERY

duces three units in each cycle of operation. Two No. 500 Syntron vibrators, one on the mold box and the other on the leveling head, do the compacting.

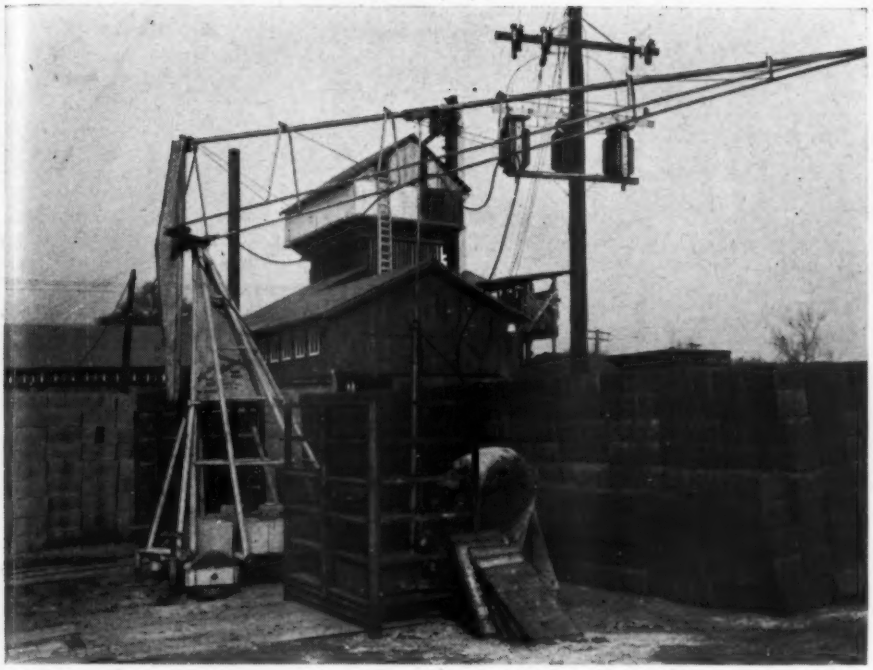
When we visited the Hamilton plant some months ago, we noted that ¾-in. plywood sheets were being used in place of the heavy steel pallets normally employed in plain-pallet machines. The pallets are fed automatically from either side of the machine, and are said to give excellent service and to require oiling not oftener than once every 30 days. The machine has three adjustments by means of which the amount of mix going into the mold box may be increased or decreased.

Actual production in this plant has run as high as 860 8-in. equivalents per hour, and on a 9-hr. shift, or 8 hours of machine operating time, output averages 7,000 standard units. The company's production is about equally divided among 4 by 8, 6 by 8 and 8 by 8 units. Switching from one size to another is accomplished by the removal of only six bolts and change-overs are said to average about 40 minutes from shutdown to restart. Most of the testing and research work, carried out before the "800" was manufactured, was done at the Hamilton plant.

Cinder units make up a large share (almost 90 percent) of this company's output, with expanded slag units accounting for the remainder. Raw cinders, washed and weathered at the point of storage, are delivered to the plant in trucks and are dumped into a ground-

• The Warren "800" block machine is a fully automatic plain pallet model which produces three units in each cycle of operation. Mixer on the balcony is a 50-cu. ft. batch-type machine.

• A general view of the block plant and storage yard of the Hamilton Concrete Products Co., Chattanooga, Tenn.



• Cured units are removed from the racks and placed in stockpiles with a portable pneumatic yard hoist. The machine shown here was invented by Millard Warren, one of the owners of the Hamilton plant.

level hopper. A short elevator lifts the material from the pit and discharges it on a 20-in. by 5-ft. belt conveyor equipped with a Cutler-Hammer magnetic pulley on the head shaft. This in turn discharges over a single-deck 4- by 9-ft. vibrating screen. The coarse material passes through an 18- by 20-in. double-roll Universal crusher, while the fines are bypassed and rejoin the flow below the crusher. The crushed cinders are then elevated and stored in one side of a 150-ton, 2-compartment Johnson semi-portable steel bin, the other half of which is used for storing bulk cement.

From the bins on, the materials flow by gravity, since the weigh batcher, the mixer and the block machine are in vertical alinement below the bins. Mixing is done with a Stearns 50-cu. ft. batch mixer located on a balcony above the machine floor.

The molded units are loaded by pneumatic off-bearer into 24-pallet racks, which are conveyed to the curing rooms by a Hyster "20" gasoline-powered lift truck. Each of the six kilns measures 12 by 32 ft. and holds 20 racks, or 1440 8-in. equivalents. The kilns open on a 20-ft. aisle inside the building; they are supplied with steam by a 75-hp. boiler. The blocks are cured with live steam for 12 hours and then removed to the storage yard, to be stacked with a Stearns yardhoist.

Under normal conditions the units are kept on the yard about 10 days before they are shipped. The company's cinder blocks attain a compressive strength of 1,000 p.s.i. in about 18 days.

In addition to standard blocks, Hamilton produces a full line of concrete masonry specials and about 60 ft. per day of lintels. Culls damaged on only one end are cut down to half-sized units with a Clipper masonry saw. The 68- by 84-ft. plant building is located on a 9-acre tract of land in the outskirts of Chattanooga. A 7-man crew is employed in the operations.

• Twenty-four pallet steel racks are handled with this gasoline-powered lift-truck.

The company is owned jointly by Carl Lackey, who is president of the firm, Millard Warren, inventor of the "800" block machine, and his brother, Shelburne M. Warren. H. E. Franklin is superintendent of the plant.

The Warren "800" block machine used at the Hamilton plant is manufactured for Roy Darden Industries, Inc., by the Link-Belt Company.

California's Concrete Pipe Industry Publicized In H. J. Kaiser Magazine

This Earth, attractive publication of the Henry J. Kaiser Company and subsidiaries, recently carried a fine story of the concrete pipe industry in California, prepared by Harold W. Chutter, president of the California Associated Concrete Pipe Manufacturers.

From a modest beginning in 1919, when a small group of pipe manufacturers banded together to form the association, the organization has grown to include 75 firms, all actively cooperating to produce ever better irrigation pipe. They employ specifications recommended by the American Society for Testing Materials, the federal government and the American Association of State Highway Officials. Henry A. Weigand, full-time engineer for the California Associated Concrete Pipe Manufacturers, works in close coordination with these organizations, and also with the state, the Bureau of Reclamation and municipal and private groups. Result of this multilateral system of cooperation, states Mr. Chutter: "A reclamation of productive land, as well as vast savings in labor and water bills to the agriculturists of California."

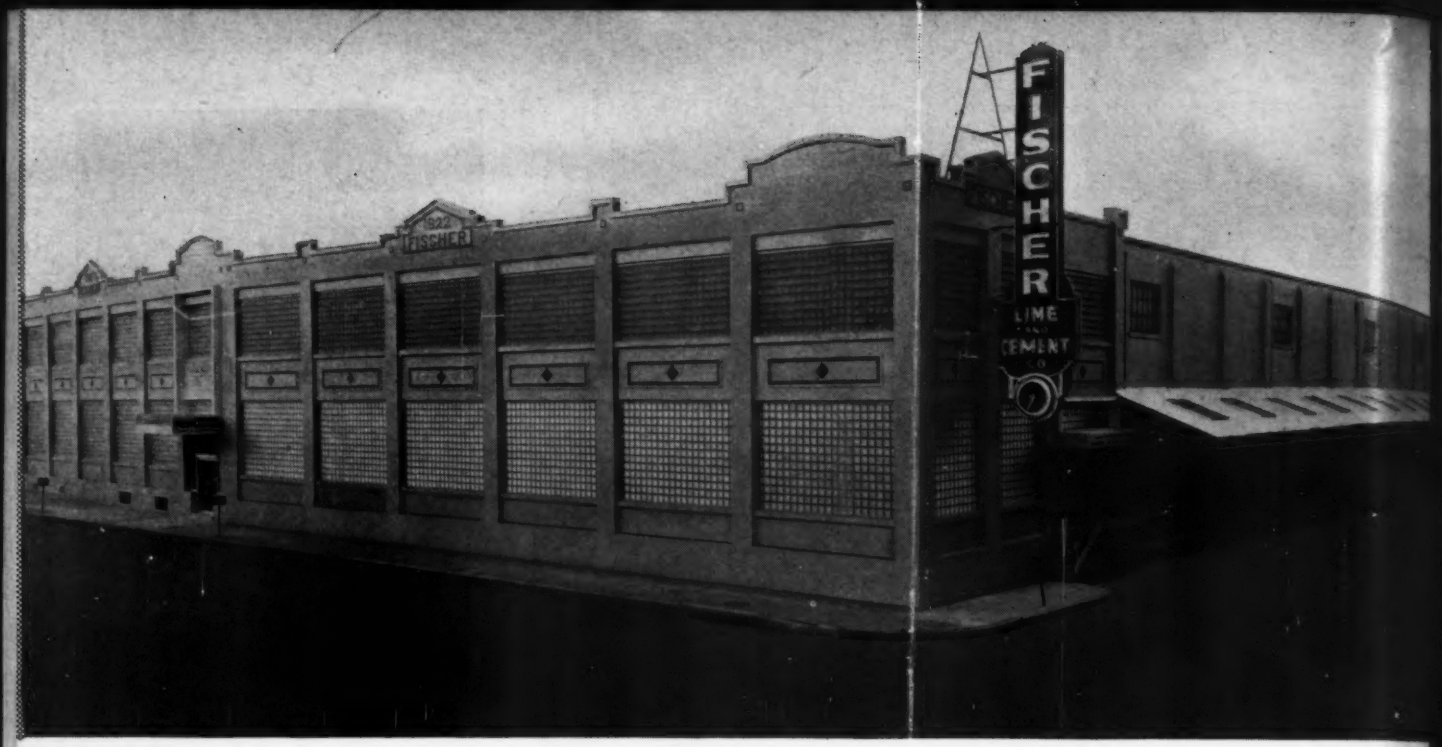
Mr. Chutter was named secretary of the organization in 1926 and president in 1930. In 1936 he was made a director of the American Concrete Pipe Association, and later (1938-1939) served as president of that group. He was chairman of a committee of the A.C.P.A. which prepared the national standard specifications for irrigation pipe.

Big Plans Afoot for 29th N.C.M.A. Meeting and Show

A double-feature event at Cleveland—the 29th annual meeting of the National Concrete Masonry Association combined with the 6th Concrete Industries Exposition—is currently being planned "on a scale intended to surpass any of these combined events previously held." The meetings of the association and the exhibits will be housed under one roof. Dates—January 31—February 3, 1949; place—Cleveland and Public Auditorium.

Members of the association are urged to contact manufacturers of equipment who have not previously exhibited their lines and to invite their participation.

A publication of the United States Department of Commerce, *Welded-Wire Fabric Reinforcement for Concrete Pipe*, (Simplified Practice Recommendation R234-48) is available at 5 cents per copy upon application to the Superintendent of Documents, U. S. Goverment Printing Office, Washington 25, D. C.



General offices and warehouses of Fischer Lime and Cement Co. are situated in the heart of Memphis.

PACEMAKER

Fischer Lime and Cement Company's New Ready-Mixed Concrete Plant Ranks Among Foremost in Industry

By HAROLD R. DRIMILLA

another ON THE SPOT report

OPERATING a new ready-mixed concrete plant, which is an outstanding example of the latest advances in design, methods and mechanization of operation, as well as other modern producing plants, the Fischer Lime & Cement Company carries on an enterprising business within a radius of 200 miles about Memphis, Tenn. Distributors of lime and cement and producers of sand and gravel, dry-batched aggregates, ready-mixed concrete and concrete block, the company also fabricates structural steel and supplies a wide variety of building materials and hardware. This aritcle, however, is chiefly concerned with the ready-mixed concrete plant and the concrete products plant.

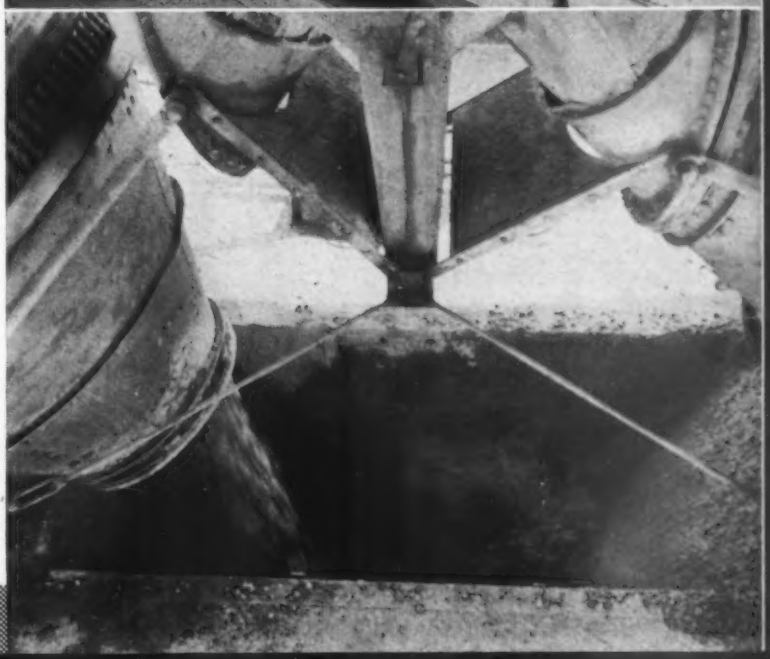
Departmental unloading platform at the rear of the general offices and warehouses.

Above: Over-all view of the recently completed ready-mixed concrete plant.

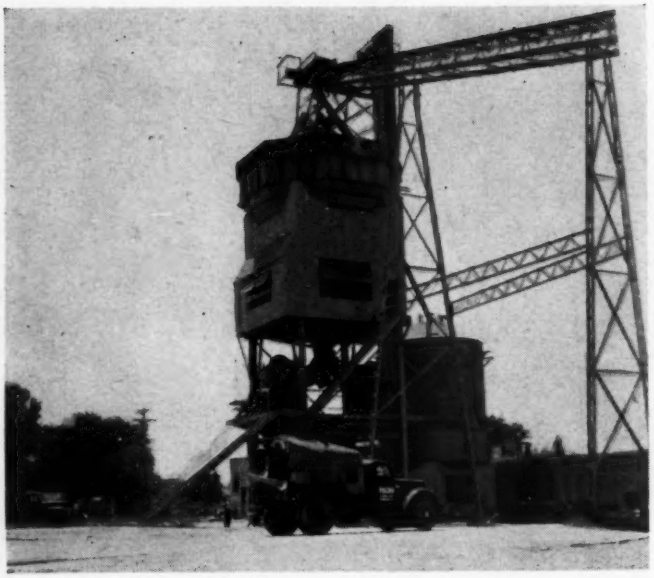
Right: From this control board one man automatically operates scales, sets and pours the desired mix.

PIONEER

Ready-Mixed Concrete Plant Fischer Lime and Cement Company's new ready-mixed concrete plant, located on a 12-acre tract of land, was completed May 31 of this year. It is a model of modern construction in this field. Built at the instigation of the company's vice-president in charge of operational plants, W. S. Walters, it was erected by the Fischer Steel Corp. The plant, including such equipment as the dry batch collector cone, weigh batching equipment, charging chutes for the mixer, wet batch concrete hopper, cement elevator, screw conveyor and various cement valves, was purchased from The C. S. Johnson Co. The Fischer Steel Corp. fabricated the aggregate belt con-



Action view of one of the tilting mixers discharging into a truck below.



View of the batching and mixing installation of the ready-mixed concrete plant, showing bin terminals of aggregate conveyor and cement elevator, batching bin, control room and tilting mixers. Company truck, in foreground, is waiting to load. In right background is the cement silo which is loaded by hopper-bottom railway cars.

veyor, bin and silo, the latter two from Johnson designs.

Aggregate can be brought into the plant by truck or rail and is discharged into the plant hopper. A short transverse inclined belt conveyor discharges onto an inclined belt conveyor to the horizontal stockpiling conveyor, which is equipped with a traveling tripper. From this stockpiling belt conveyor aggregate can be discharged into the stockpile or delivered via the main inclined belt conveyor to the top of the 105-ft. plant. Aggregate is reclaimed from storage by a reclaiming belt conveyor in a 250-ft. concrete ground-level tunnel, which is inclined to discharge back onto the inclined conveyor preceding the stockpiling conveyor. For greater storage capacity aggregate is also discharged by truck directly on the stockpile.

Cement is unloaded from hopper-bottom railway cars through flexible canvas connections into a 10-in.-dia. screw 30 ft. long, which carries it underneath an auxiliary storage silo into the boot of the cement bucket elevator. The cement elevator is 95 ft. 6 in. high and has a capacity of 300 bbls. per hour. Cement flow from the top of the elevator is controlled by a two-way valve, either into the central cement compartment of the overhead bin or to the auxiliary storage silo. At the top of the bin and also at the top of the silo is a three-way rotary cement valve for directing the flow of cement to any one of three cement storage compartments.

The cement silo is 20 ft. in diameter, with an overall height of 40 ft., and has a storage capacity of 2,330 bbl. Like the cement tank in the overhead bin, it is divided into three compartments. The bottom of the silo contains three emergency gates and rotary plug valves for controlling cement flow out of the silo back into the 10-in.-dia. track screw. While cement is normally handled directly from cars into the overhead bin, the auxiliary storage silo, used for emergency storage, can be drawn from if an expected shipment does not show up. The bottom cone of the silo is equipped with aeration fittings which are used only when cement is drawn from the silo. All of the cement valve controls are at the base of the cement elevator and are ground controlled. The position of the aggregate pivoted distributor at the top of the bin is controlled by cables running down to a control capstan at ground level.

The bin is a 314-cu.-yd.-capacity Johnson Octo-Bin. Cement is stored in a central, all-welded circular tank which is divided into three equal compartments. These sections are provided with aeration fittings in the bottom of the bin and have diffuser filters to prevent cement from flowing back into the pipe line. The aggregate section surrounding the central cement compartment is divided into four sections. Total cement storage is 425 bbl., leaving 250 cu. yds. for aggregates. Bin height is 73 ft., 6 in. to the top of the cement compartment to provide 11 ft. clearance under the concrete hopper discharge gate.

Interior of the ready-mixed concrete plant. Equipment at the extreme right has been replaced with a new block machine.

Building and yards of the concrete products plant.

Batching equipment consists of four aggregate batchers, one cement batcher, one water weigh batcher and a control cabinet containing the six dial scale units with recording chart, 12-position mix selector unit and the electrical contact mechanism for controlling the filling and discharging of the batchers.

The Johnson aggregate batchers (4000-lb. dial, 75-cu. ft. hoppers) are fitted with square fill valve openings controlled by air rams and electric solenoid valves so that the sequence of discharging can be electrically controlled. Filling of the cement batcher (3000-lb. dial, 38-cu. ft. hopper) is controlled by three electro-pneumatic plug valves, one for each of the three compartments. It is possible to change types of cement instantly by turning the selector switch on the control panel. The water batcher (2000-lb. dial, 240-gal. hopper) has two discharge valves, one for each of the tilting mixers. Water is weighed into the hopper from a 400-gal. storage reservoir.

The scale lever pull from each of the six batchers is transmitted to the control box containing the dial units. These Johnson dial scale units are of a special narrow type indicating on a single chart the actual weight of the material in each of the hoppers at all times.

To discharge the batchers to the mixers, the operator merely presses a button on the control board. Electrical interlocks prevent the discharge of the batchers unless weights and operational procedures are normal. A manual selector provides discharge of the batchers without automatic weighing when the operator so desires.

An electrical timer discharges each batcher in a pre-set sequence. Each discharge gate opening is limited by an adjusting screw, so that material feeds to the mixer in an approximately uniform flow.

The Johnson mix selector is especially interesting. Twelve mixes can be pre-set in the automatic control. The operator turns a knob to the desired mix, then presses the automatic batch button and all of the batchers weigh up to the selected mix. The mix selector can be changed at any time after the batch is weighed up. When the batching button is again pressed, the batcher, following discharge, will then batch the newly-selected mix. When odd mixes beyond the 12 already set are required, they can be batched up by the use of pushbuttons on the control panel. After a batch has been automatically weighed up, additional amounts can be added by pushing control buttons for each of the weigh batchers. Since a separate batcher is used for each material, they all weigh up simultaneously and batching can be accomplished in from 12 to 20 seconds. The electrical discharge cycle is set for 15 seconds.

The control cabinet is equipped with a moisture compensating device. Moisture percent is set on a graduated knob after making a moisture test of the sand. This compensator automatically increases the weight of the sand by the percentage set on the knob and at the same time decreases the weight of water in accordance with the amount of moisture in the sand. Such correction, which can be applied to any of the 12 pre-set batches or the manually weighed batches, is necessary only when the moisture of the sand changes.

The mixers are two 4-cu. yd. capacity Koehring tilting mixers which were used in the building of the Grand Coulee Dam before being moved to the Fischer plant. They are mounted on a separate concrete foundation which also supports the concrete wet batch hopper. Charged by an air-operated, two-way charging chute, supported by the dry batch collector cone hanging on the batcher floor beams, they are tilted and righted by compressed air. Large charging and discharging openings permit the mixers to be charged in approximately 10 seconds and discharged in from 7 to 9 seconds. In charging truck mixers, full mixing time is not required, since it is necessary only to preshrink the batch.

The plant output capacity, using the two 4-cu. yd. tilting mixers and the full three-minute standard mixing time, is 140 cu. yds. per hour. With the use of truck mixers and pre-shrinking, the output could be increased up to the maximum capacity of the 24-in. belt conveyor feeding the bin. Present output,

Main offices, recently remodelled, are air-conditioned and ultra-modern.

figuring on a scheduled setup for 4 cu. yds. every two minutes, is 1,000 cu. yds. per day.

Delivery is accomplished with 30 company-owned trucks painted in the locally familiar Fischer green and red colors. Feeding, mixing and loading of the trucks is an example of carefully planned efficiency. In immediate charge of these operations is plant superintendent J. E. Bagwell.

Fischer Lime and Cement was one of the pioneers in the South in the ready-mixed concrete industry, having begun production about 19 years ago. Operations then, and up until the construction of the new plant, were conducted in a small plant in the rear of the main offices. This plant is now used only for uptown business and standby purposes.

Concrete Products Plant The concrete products plant of Fischer Lime & Cement Co., which today is one of the largest and most modern in the South, began operations in 1939 on a comparatively small scale. With the use of a single block machine, daily output amounted to 1,000 blocks. In 1940 a Stearns Joltcrete machine was installed, and production was boosted to 2,500 blocks per day. An expansion program carried out in 1945 included the erection of the present building. As the result of vastly increased facilities, the plant's daily production increased to a total of 6,000 blocks. Since then continued expansion to meet steadily increasing demand has almost doubled this figure. In addition the plant turns out 1,200 ft. of drain tile per day. Colored brick is also manufactured, the daily capacity being about 15,000 bricks. No set schedule is maintained in the production of brick. Sufficient stock is kept on hand and additions are made as required.

Equipment now in use at the concrete products plant includes two Stearns Joltcretes and one Lith-I-Block. The Stearns machines, one a Joltcrete No. 9 and the other a Joltcrete No. 7, are placed side by side. The Lith-I-Block, situated to the rear of the plant, is the latest machinery addition. It was brought in to replace other block making equipment which the company had been using. The present output of the plant, on a 10-hour basis, is 10,800 standard blocks daily.

Finished blocks are carried on a 5-ton Clark Trucklift to the five steam kilns which line the opposite wall of the building. Three have space for 27 racks; the other two are somewhat smaller in size.

The spacious grounds around the plant extend all the way to the Fischer Steel Corp. building, which is about a city block's distance. The grounds are extremely well kept, indicative of the efficiency which is notable throughout the plant. Stockpiling is done with an eye to easy removal. Blocks are stored in convenient piles, from which they are loaded onto trucks for delivery. A stock of about 300,000 blocks is kept on hand.

The plant normally employs about 20 men. Tom Branch is plant superintendent and L. T. Sumner the designing engineer.

Fischer History All the Fischer operations are controlled from the main offices, situated in the heart of Memphis. It was at this location that the company made its start in an old cotton compressor shed back in 1906. Founders were W. W. Fischer and W. N. Fry Sr. and the latter's wife. The first unit of the company's present setup was constructed in 1911. Today it forms but a small portion of the main offices and warehouse. The two-story structure, plus basement, as it now stands, was completed in 1922. The air-conditioned offices and other facilities which were remodeled a little more than a year ago, following a destructive fire, are completely modern in all respects. They do justice to a $2,000,000 organization.

Situated just to the rear of the offices are warehouse facilities for 1,000,000 sq. ft. of storage space. Other buildings and installations of the Fischer company, which occupy fully the space of a square city block, are the previously mentioned small ready-mixed plant, a ready-mixed mortar plant, a repair shop and a sash and door department building. A railway line runs right through the grounds.

Other subsidiaries of the Fischer Lime & Cement Company of Memphis are: the Greenville Sand and Gravel Co., Greenville, Miss.; the Clay Products Corp., Okolona, Miss., a small clay brick plant manufacturing face and common brick; and, previously mentioned, the Fischer Steel Corp., Memphis Tenn.

Company officials include Lee T. McCourt, president; W. N. Fry Jr., executive vice-president; W. S. Walters, vice-president in charge of all operational plants; John D. Moran, vice-president; and W. F. McGee, vice-president and co-ordinator of supplies and sales.

Terry Carpenter Announces New Supply Depot in Casper

Terry Carpenter, Ltd., a firm operating a high-pressure steam-cured concrete products plant at Scottsbluff, Neb., has set up a branch supply depot at 420 East "C" street in Casper, Wyo.

The Carpenter company also has announced production on a new product called "power block" which will be sold delivered on the job in the Scottsbluff, Cheyenne and Casper areas.

Gilroy (Calif.) residents were interested in the opening of a new industry in their community recently when the Cristolite Block Company went into production. The firm will manufacture pumice units.

Three Brothers Win Reputation for Quality at "Home-Made" Plant

another ON THE SPOT report

WHITE'S Concrete Block Co. of Spokane, Washington, is owned by three young men, all brothers—Edward L., Harold J., and William M. White. It is a new enterprise, started in the summer of 1947, and

By HARRY F. UTLEY

stands as a monument to youthful energy, enterprise, and hard work. Not only is the plant owned by the White brothers, it was also built by them in its entirety, and is operated solely by these three young men without any hired help.

Though aware that they were entering a highly competitive local market, the boys mentally adopted a slogan then being widely used by a leading cigarette manufacturer—"quality of product is essential to continued success"—and made certain that every unit they produced was a quality unit in every respect. They quickly gained a reputation for manufacturing high-grade block and the enterprise has been a success from the start, the ledger showing that net profits have averaged better than $3,000 per month!

Production schedules were set up to enable the three men to operate the plant most efficiently. Kiln capacity is 1,500 units of 8 by 8 by 16's, or equivalent, and the Scripps-Pearson block machine is operated only

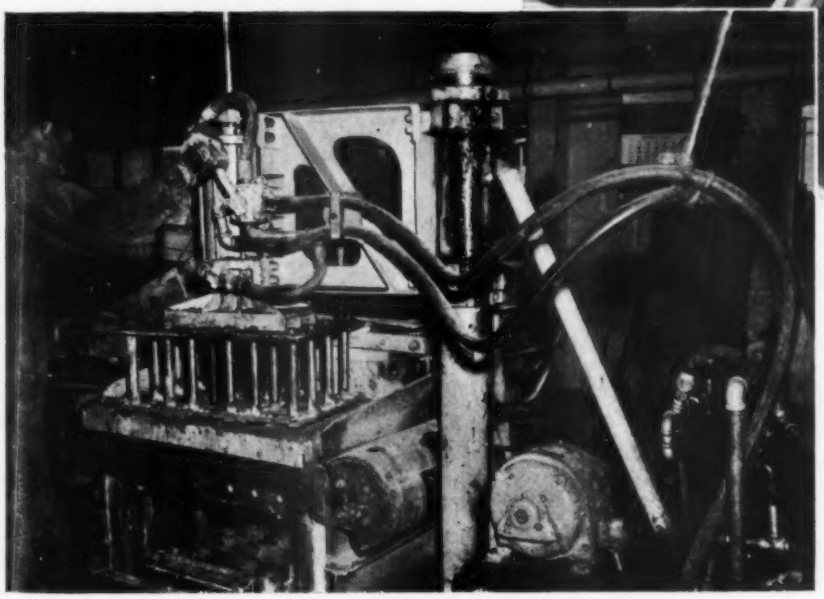
Two-thirds of the owner-operator group—Edward L. and Harold J. White—pose before one of White Concrete Block Company's delivery trucks.

4 hours a day in molding this quota. At other times the Whites are busy unloading the previous day's output from the kilns and stacking them in the yard, making deliveries, doing repair and maintenance work, etc.

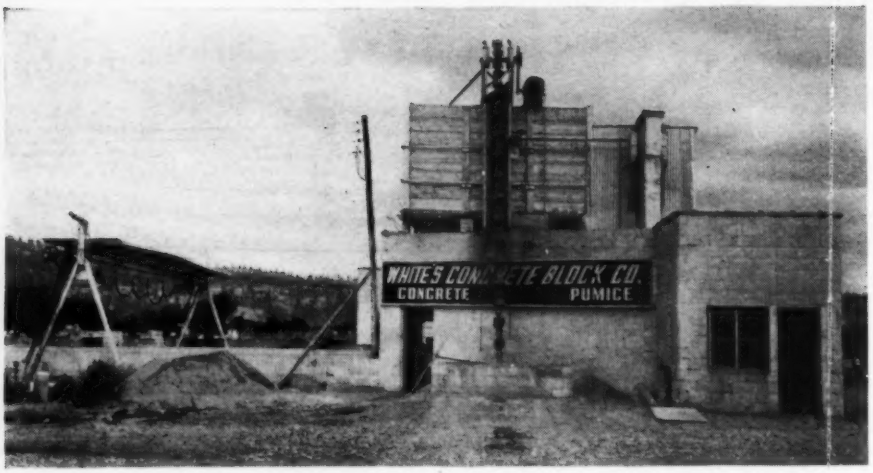
Output has been about equally divided between pumice and gravel block. The pumice comes from the Lloyd Williamson deposits at Bend, Ore., and arrives by rail; the heavier aggregate is a mixture of pea gravel,

This view shows the concrete conveyor feeding the hopper of the block machine. The roller-conveyor transfer point is seen at the left.

One of the White brothers at the hydraulic control of the block machine.



concrete and plaster sands, blended and delivered to the White plant by the Smith Sand & Gravel Co. of Spokane. Aggregates are elevated and stored in a 2-compartment bin above the volumetric batcher. Bulk cement, ordinary portland, is used exclusively and is stored in a 150-bbl. elevated bin with screw feed to the batcher. Darex is regularly



A view of the plant, showing the power-operated cable (left) which fills the roofless kilns with block.

used in the mix, 2 oz. per sack of cement being added at the Scripps-Pearson 14-cu. ft. mixer. Use of the admixture is well worth its small extra cost, the Whites discovered, for it yields a plastic, more workable mix and results in uniformly dense, waterproof blocks. The concrete is fed to the block machine hopper by a short inclined belt conveyor leading up from the mixer.

In equipping the plant, the White brothers were long on ambition but short on capital. They made a thorough investigation of production equipment before selecting their Scripps-Pearson machine. In almost daily service since the plant went into operation, this machine, a fully-hydraulic, semi-automatic unit has performed as anticipated, and the owners feel the choice was a wise one indeed. Three 8- by 8- by 16-in. block are made at a time on a single plain pallet, the concrete being compacted by dual vibrators and the tops of the units smoothly and uniformly pressed by a combination packerhead and hydraulic stripper operating under 3,750-lb. pressure.

The palleted block are borne away from the machine by roller conveyor direct to the curing kilns, which are unusual in design and are filled automatically. There are two kilns, each having a capacity of 750 blocks. They are of concrete masonry and poured concerete construction, 12 ft. wide, 75 ft. long and only 3 ft. in overall height to accommodate a single layer of blocks —50 rows of 15 each. They are filled automatically, each 15-unit row on five pallets being moved by a power-operated cable which stops automatically when it reaches the end of the kiln (or the last row of blocks sent into the kiln previously) reversing and returning to the plant end to pick up 15 more blocks. The palleted units slide along over wooden sleepers, or rails, which extend the length of the kilns and are greased occasionally to reduce friction. As soon as one kiln is filled, removable cover sections are battened down and the steam turned on. Piping along each side of the kilns circulates the steam and petcocks every 4 ft. release sufficient steam for proper moist curing. A 30-hp. boiler fired by an automatic coal stoker generates the steam.

An electric-powered traveling bridge crane spans the two kilns and lifts out the rows of blocks, 15 at a time, the first thing in the morning, stacking them alongside. Later in the day they are taken off the pallets, trucked to the storage yard and piled for further curing, after the morning cycle of block production has been completed.

The concrete mixture is carefully designed and frequently checked to yield blocks of uniform strength and density. Pumice units test within close limits in the 950-1,000 p.s.i. range, while the gravel block run around 1,500 p.s.i. regularly, with little variation in test results.

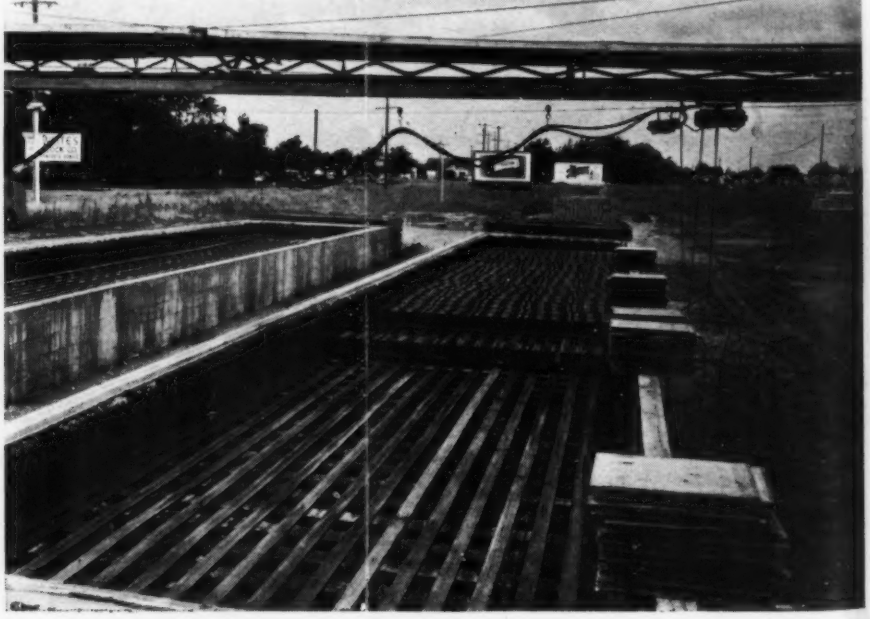
$10,000 Machine Installed At Kennewick Layrite Plant

At Kennewick, Wash., the Layrite Company, manufacturers of concrete and pumice block, recently installed a new $10,000 machine which will produce 6,000 units per day, increasing production by 200 percent. R. W. Ross, owner and manager, stated that it is the only machine of its kind in the state.

The Layrite plant covers 10 acres, and officials are at present contemplating the expansion of their office space to meet the demands of steadily increasing business. Layrite has been located in Kennewick for five years, during which it has produced approximately 10,000,000 units. The major portion of present production is being absorbed by a housing project requiring 500,000 blocks. More than 80 kinds of block are made at the plant.

J. A. Comstock is the proprietor of a plant at Ranier, Ore., which turns out Interlox Brix chimney blocks and concrete masonry blocks. The former product is a block molded to specifications and tongued and grooved vertically and horizontally for the construction of fire-safe chimneys which are sufficiently flexible to allow for contraction and expansion due to changing weather conditions.

A sure way to reduce some of the 2½ billion dollars worth of foodstuffs destroyed each year by rats is to ratproof dairy barns, granaries, poultry houses, hog houses and other buildings—with concrete.—*The Lawrence Dragon.*



The two kilns each have a capacity of 750 blocks. The one at the right is about half filled and a row of 15 freshly-made units is being moved into position. Note the traveling crane spanning the two kilns.

N.R.M.C.A. Directors Consider Major Problems at Mid-Year Meeting

By WALTER E. TRAUFFER

another ON THE SPOT report

THE mid-year meeting of the board of directors of the National Ready Mixed Concrete Assn. was held at The Broadmoor, Colorado Springs, Colo., on September 22, 1948, following the meeting of the National Sand & Gravel Assn. board there on September 20. A joint meeting of the two boards followed. These were among the most successful of any meetings ever held by these groups from the standpoint of attendance, results achieved, etc. Most of the directors brought their wives and all took advantage of the opportunity afforded to see the many natural scenic wonders in this area. All agreed that future mid-year board meetings be held at similar resorts and several possibilities were suggested for 1949, including White Sulphur Springs, W. Va., and Asheville, N. C.

In his opening address, President C. ("Dolly") Gray reviewed the important developments since the last annual meeting. The association, he said, is in excellent financial condition and its membership is the largest in its history. There has been a satisfactory increase in membership; and it was decided to continue the series of regional meetings held primarily for this purpose. There was also some discussion of the program for the coming annual convention.

Stanton Walker, director of engineering, in his report reviewed the

• Harry F. Thomson, St. Louis, Mo., T. E. Popplewell, Fort Worth Sand & Gravel Co., Fort Worth, Tex., and Stephen Stepanian, Arrow Sand & Gravel Co., Columbus, O.

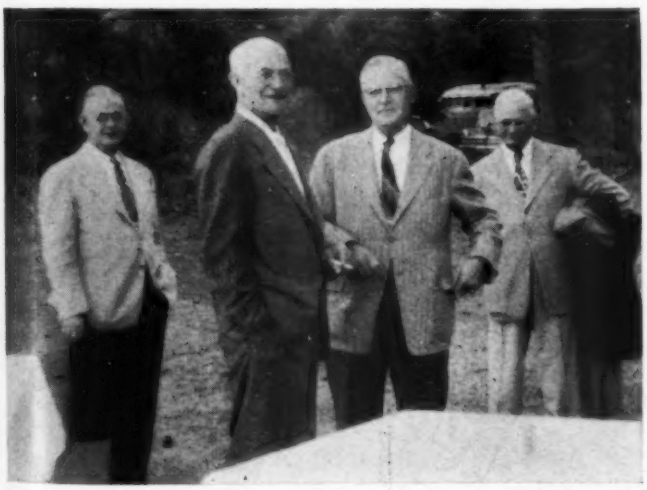
appointment of a committee on recommended practice for sampling and testing concrete; he told of the committee's discussions with the heads of leading laboratories. The resulting rough draft, he said, will be improved and expanded into a manual which the A.C.I. or A.S.T.M. may later be asked to endorse. Mr. Walker stated that the report of the committee on truck chassis has been sent out to the membership and further work is being done on this subject. The manual and the booklet on control of quality are being combined into one volume of which the first draft has been completed. Mr. Walker also described some of the research work which needs to be done. He said that the new quarters on the University of Maryland campus will be ready early in 1949.

According to Vincent P. Ahearn, executive secretary, the cement decision created serious problems for the industry. In spite of a substantial increase in cement production over the record 1947 figures the shortage in some areas is the worst in history. Further efforts to get a clear picture of the effect of higher rates on the industry will be made in time for findings to be presented at the coming annual convention.

It was decided at this meeting to stand on the present manual on cost accounting and not to develop a detailed system at this time. It was also voted to make further study of the owner-driver problem. The proposal of an over-all industry production survey brought out the fact that there is now no source of such information. Mr. Ahearn said that this was a job for the industry and it was decided to have the association staff conduct this survey.

With regard to the 1947-8 safety contest for association members Mr. Ahearn said that participation was slightly greater than in the first year's contest but still far below expectations. In urging greater inter-

(*Continued on page* 161)



• R. F. Porter, Harry T. Campbell Sons Co., Towson, Md., C. (Dolly) Gray, Ready Mixed Concrete Corp., Indianapolis, Ind., F. P. Spratlen Jr., Ready Mixed Concrete Co., Denver, Colo., and F. D. Coppock, American Aggregates Corp., Columbus, O.

• Mr. and Mrs. Walter F. Tews, Tews Lime & Cement Co., Milwaukee, Wis., and Mr. and Mrs. R. L. Collison, Palmer House, Chicago.

Interlocking Blocks Laid in Floor System Provide Revolutionary Radiant Heat Plan

another ON THE SPOT report

A dual system of radiant and convection heating utilizing the horizontal core system of Mortarless interlocking blocks laid flat in the floor has just been announced by the Mortarless Tile Machine Co. of Los Angeles.

Perfected by Rembac Bros., Visalia, Calif., producer of Mortarless interlocking blocks, this method has achieved marked success in numerous installations and is now offered nationally by the Los Angeles concern, its patentee.

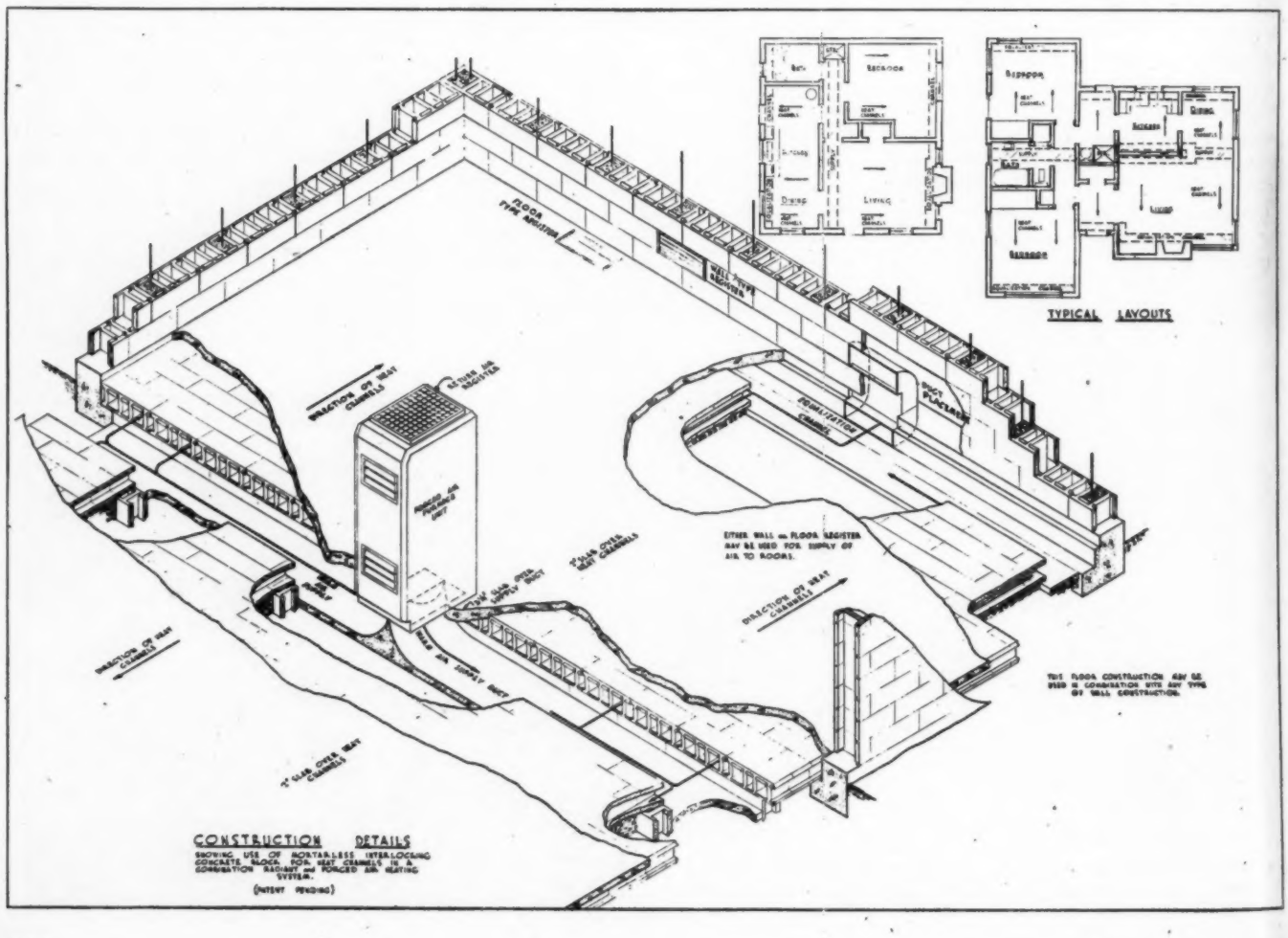
Mortarless interlocking 6-in. and 8-in. wide (regular and half) blocks are used, as illustrated in the accompanying drawing. Because of the large core areas and the tight interlock between units, the blocks line up perfectly to form parallel heat-transmitting channels in the floor. Comfortably heated rooms and warm floors are the result, making the added expense of a basement to house the heating plant unnecessary.

The foundation is prepared by conventional methods, the ground being solidified and well tamped. Over this a 2-in. base course of pea gravel or 3/8-in. crushed rock is laid and leveled. Mortarless blocks are placed directly over this sub-base. The core-hole ducts run at right angles to the heat-input channel, which is in direct line with the heating unit. An equalization channel runs along the inside of the foundation of the exterior walls. The hot air circulated through the ductwork heats the floor, which acts as the radiating surface. This same air contains residual heat which is also utilized by exhausting it through conventional louvered wall or floor-type registers into the room.

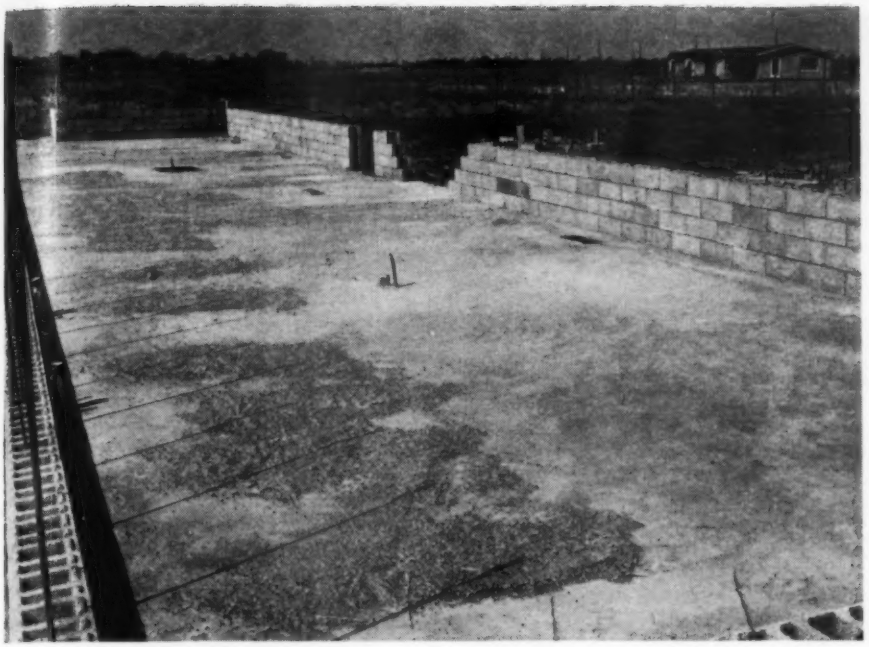
After the floor blocks have been laid and inspected, a 2-in. concrete slab is poured over the block and given a smooth finish. This slab, together with the 1¼ in. of concrete in the top sides of the blocks to which it is bonded, results in a total floor thickness of 3¼ in. The owner may elect to use the concrete floor itself, or it may be covered with linoleum, hardwood, or wall-to-wall carpeting.

Since no piping, electrical elements, or sheet-metal ducts are employed, the higher cost of this type of heating is adjusted, bringing it within easy reach of even the most modest home builder. The entire job is, therefore, one for the concrete manufacturer. Because of the low cost of installation, the system is expected to have great appeal in the mass-housing, small-home field, as well as for commercial and industrial structures.

Combination radiation-and-convection heating has been found the most efficient for winter comfort in recent university tests. In addition, the mortarless radiant heat installation makes possible a summer cooling system by utilizing the furnace



• Pictorial sketch showing a dual system of radiant and convection heating through the use of interlocking block in home wall construction.



• Radiant-heat floor installed in a California concrete-masonry home. Register openings may be seen.

fan, independently of the fire-box. Summer temperatures are thus reduced as much as 10 degrees.

Development of the system came about as a co-operative effort on the part of Brown & Treadway, prominent architectural and engineering firm of Los Angeles, and the technical staff of the Mortarless.

License to manufacture the units and sell the system is granted by the Mortarless Tile Machine Co. on a protected territorial basis. All engineering sheets, detailed plans, installation and operating instructions, together with heat-loss calculation charts, are supplied by the company to franchised plants, and to architects, engineers and builders.

N. R. M. C. A. Directors

(*From page* 163)

est in this subject he pointed out that the companies with the best safety records had the lowest man-hour costs and the best physical plants. He also said that even if a company does not win in this contest it can still show up well in comparison with other local truckers and create needed good will.

At the joint meetings of both boards it was decided to hold a 4-day convention in New York in 1949. The National Sand & Gravel Assn. board will meet on the morning of Monday, February 14, and the National Ready Mixed Concrete Assn. board in the afternoon. The combined convention will begin on Tuesday morning, February 15. The locations for succeeding conventions were confirmed—Chicago in 1950, New Orleans in 1951 and Chicago in 1952. San Francisco was recommended for 1953.

Mr. Ahearn reported on the wage-and-hour survey made of the industry, and it was decided to bring this information up-to-date four times annually. He also described an attempt by a labor union to force the hiring of an engineer for each truck by boycotting ready-mixed concrete on a construction project in northern Illinois. This case was taken to the National Labor Relations Board and won by the operator. The joint boards authorized Mr. Ahearn to appear for them before Senate and House committees on wages and hours, labor relations, and the transportation tax.

NEW MACHINERY and SUPPLIES

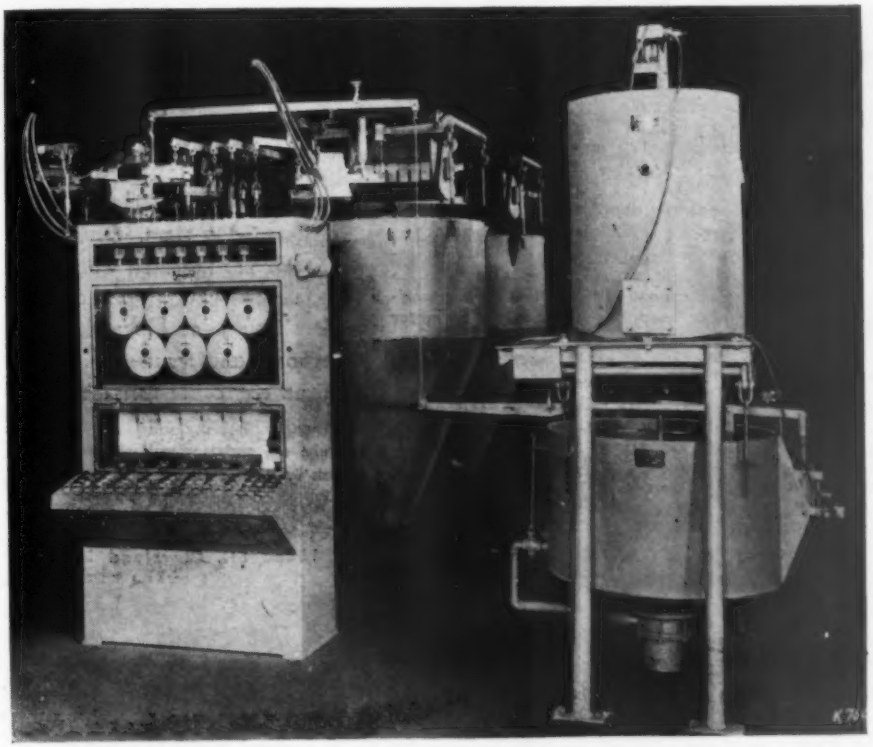
• Waterproofing Compound

A new waterproofing compound known as "Sil-o-Seal" has been developed by the Frederick O'Brien Co. of Huntington Park, Calif. Sil-o-Seal makes use of a chemical known as silicone which has properties similar to glass. Characteristics include clear transparency, heat stability, and water repellence. It is claimed this preparation penetrates the surface without coating or coloring it.

This compound can be applied either by brush or by low pressure spraying. Before applying, the surface must be clean, dry and free from residue.

Sil-o-Seal may be used on below-grade exteriors as well as on the above grade. A gallon of this compound will cover approximately 200 sq. ft. of wall area.

• Automatic Mix Selector



The C. S. Johnson automatic mix selector for concrete central mixing or batching plants provides for automatic pre-set control of 12 mixes. The operator turns a knob to the desired mix, then presses the automatic batch button and all of the batchers weigh up automatically to the pre-set mix. After that

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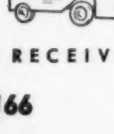

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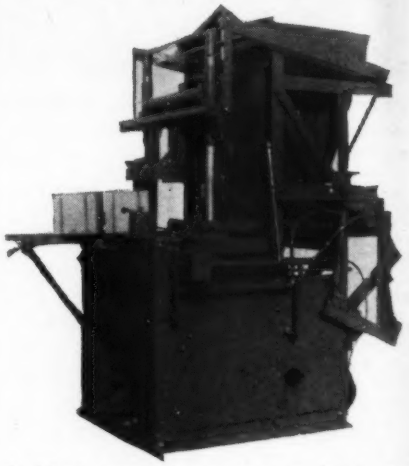
batch is weighed up, the operator can change the mix selector, if a different mix is desired, for his next batch. The mix selector can be changed at any time after the batch is weighed up.

When odd mixes beyond the 12 preset in the control stand are required, they are batched up by use of pushbuttons on the panel. If a batch is already weighed up automatically, additional amounts can be added by use of the pushbutton control provided for each of the weigh batchers. The C. S. Johnson Co., Box 71, Champaign, Ill.

● Hydraulic Block Machine

A hydraulic block machine recently put on the market by the Praschak Machine Co., Highway 13, So., Marshfield, Wis., is the latest addition to this firm's concrete products machinery. According to the manufacturer, it will make up to



six blocks per minute (two 8- by 8- by 16-in., one 8- by 8- by 16-in. and two 4- by 8- by 16-in., or one 12- by 8- by 16-in. per operation). All attachments are standard equipment.

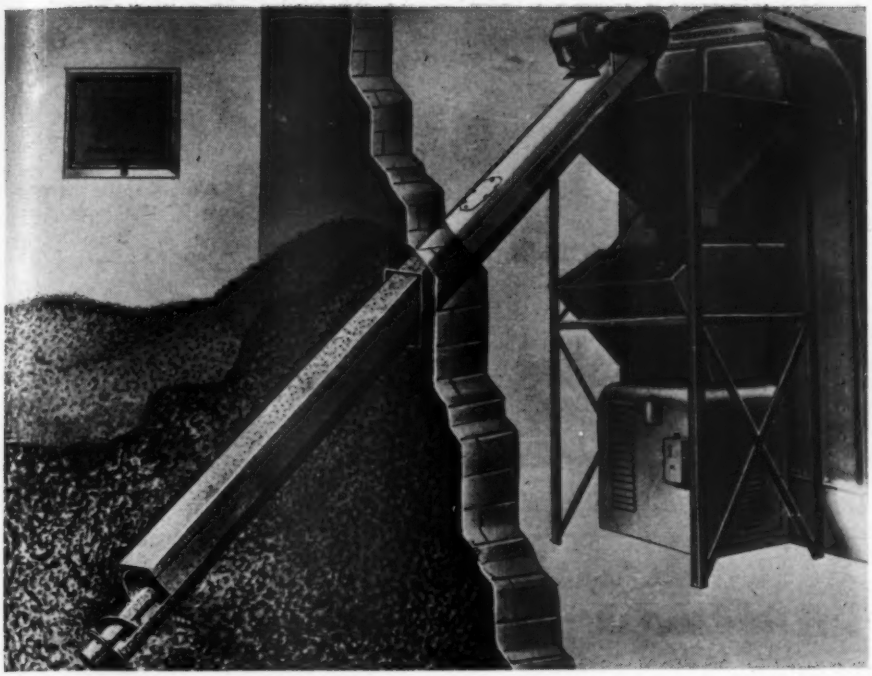
The material box is brought forward over the mould box by hydraulic power. When the blocks have been made, it is brought back to its original position, where it is automatically filled for the next cycle. The blocks are vibrated by dual vibration, and at the same time a heavy tamper is used. Stripping is also done by hydraulic power. A receiver is provided to remove the blocks before the next operation.

● Bin-to-Stoker Conveyor

The purpose of the Baughman Model 215 is to save time and labor for the engineer or fireman in moving screenings from the storage bunker to the overhead storage hopper or feed hopper of the stoker.

Under average conditions, states the manufacturer, the Baughman Bin-To-Stoker conveyor will soon pay for itself in labor saved, in releasing manpower for more important duties and in making sure that there is an ample supply of fuel in the feel hoppers at all times.

A large 9-in.-diameter steel auger or screw is used, turning in a 10-in. diameter steel casing. Except where unusually large capacity is required, the screw



operates very slowly and intermittently. The power (any standard electric current supply) can be manually or automatically controlled. By the use of pressure switches applied to the steel feed hopper, the conveyor can be started at a predetermined low level and automatically stopped at the desired high level. The conveyor body is stiff and strong, and thus requires only a nominal amount of support. The lower end is designed to be self-feeding, so long as fuel surrounds it. In many installations where the stoker conveyor is fed by other conveyor apparatus, the boot end may be sunk in the floor and fed through a floor hopper left open or covered by a grating. The Baughman Model 215 lends itself readily to old boiler rooms and power plant conditions, as it is very compact in design and takes up very little room.

The setting may vary from horizontal to 60 degrees, with but slight lessening of capacity. Likewise, the speed of the screw or operating cycles can be varied to accommodate capacity to stoker consumption. Baughman Model 215 conveyors can be operated as a single unit feeding double hoppers or may be employed in batteries of two or more. The Baughman Mfg. Co., Jerseyville, Ill.

● Six Wheel Truck

Introduction of a new six-wheel series of Dodge "Job-Rated" trucks with tandem dual drive rear axles for rugged uses up to 34,000 pounds gross vehicle weight was announced by officials of the Dodge Division, Chrysler Corporation, Detroit, Mich.

Designated as the B-1-VX model, the six-wheelers are available in three wheelbases—154, 172 and 190 inches. They are expected to find wide usage for transit concrete mixers construction and heavy-duty dump work, or where additional traction is required for off-the-highway use.

Equal power is transmitted to both rear axles by the heavy-duty two-speed torque divider with inter-axle locking differential. Ratios are selected by convenient cab control. Separate propeller shafts from the torque divider to each axle transmit equal torque to both rear axles.

The bogie unit is especially engineered for tough jobs. The torque rods are arranged in a parallelogram to keep axles in correct alignment regardless of their relative positions.

Full floating rear spring suspension equalizes the load between the two rear axles. Among the outstanding features of the new six-wheelers is the heavily constructed frame with full-depth out-

side channel type reinforcements to the end of the frame. One hundred per cent air brakes are standard equipment.

The Lith-I-Bar Company of Holland, Mich., recently leased a portion of the Lake Shore Sugar Company's plant in that city to accommodate expanding business. Lith-I-Bar manufactures machinery for making concrete block, bars, and drain tile. The concern is owned by F. E. Milewski and L. W. Lamb.

MORTARLESS RADIANT HEAT*
Opens Doorway to New Profits

● Economical radiant-heat installations using the continuous cores of precision-made Mortarless Interlocking blocks are now available.

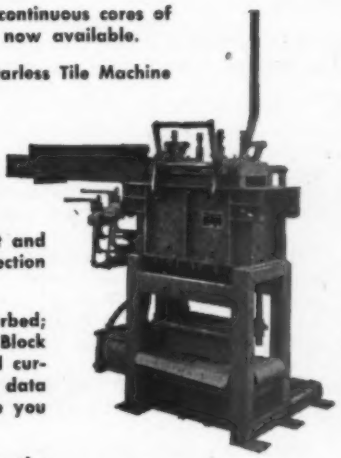
● After two years' development in the field, Mortarless Tile Machine Co. now offers the concrete products industry its most promising development in a decade.

● Engineered by recognized architects and heating experts, the Mortarless Method simply lays a floor with the cores of the Mortarless Interlocking blocks running horizontally, forming tight ducts. Result — the most practical, efficient and economical system of Dual Radiant and Convection Heating yet devised.

● Your existing plant layout need not be disturbed; merely add a Mortarless Interlocking Hydraulic Block Machine using your present batching, mixing, and curing facilities. This, together with the engineering data and detailed plans which we furnish, will enable you quickly to enter this new lucrative field.

● Sold on a protected territory basis, you are the only producer of these patented units in your area.

*Patent Pending.



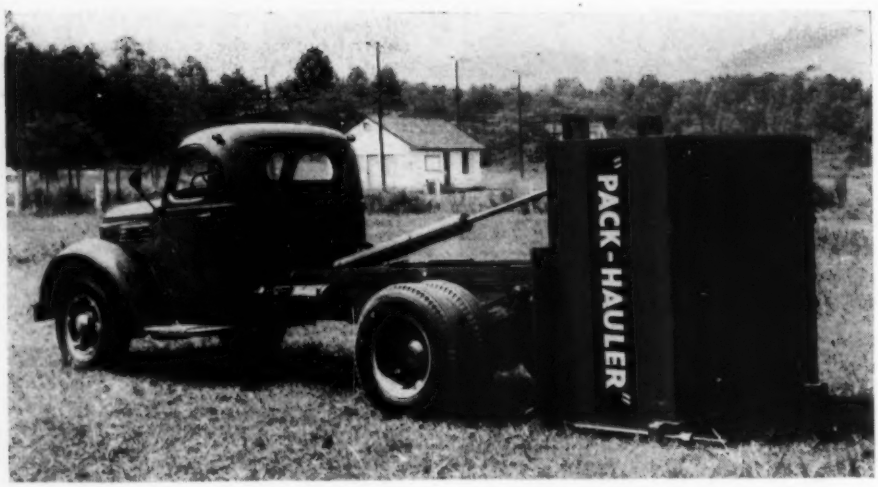
Mortarless Interlocking Hydraulic Block Machines are available in both single-unit and two-at-a-time models. Investigate this sturdy, time-tried, dependable equipment.

MORTARLESS PATENTED

EXCLUSIVE FRANCHISES AVAILABLE . . . WRITE, WIRE OR CALL TODAY!

Mortarless Tile Machine Co.

2623 Riverside Drive Los Angeles 26, Calif.



● Materials-Handling Truck

The "Pack-Hauler," designed by the American Truck and Body Co., Martinsville, Va., has been designed as a solution to materials-handling problems. Hydraulically operated for simplicity and smoothness of action, it is highly maneuverable, enabling the operator to place materials quickly on the job. According to the manufacturer, it eliminates the need for pallets and nullifies breakage. It can be used for handling block, brick, hollow tile, or any cubed material. (See illustration at left.)

● Fork Truck

The Model F-16, a 16,000 lb. capacity fork truck with boom attachment is now in production at Erickson Special Equipment Mfg. Co., 1401 Marshall Street,

N. E., Minneapolis, Minn. Front and rear wheels are equipped with dual tires. Steering is accomplished with a hydraulic booster, operating on the trunnion principle, with outside turning radius of 12½ ft. The unit is powered by a 6-cylinder International Harvester engine with four speed transmission. Twin hydraulic hoists operate the forks and the boom rig. The capacity of the boom is 4,000 lbs., maximum lift, 18 ft. The forks, utility forks with socket position for different heights, will hoist 16,000 lbs. up to 15½ ft.

● Mortar Box and Table

W. T. Pettit and Sons, Inc., 129 South Center St., Youngstown, O., offers two pieces of equipment for the concrete products industry. The "Petco" mortar box is constructed of 14-gauge steel, electrically welded. Top and bottom are reinforced with 1- by 1-in. angles. The rounded ends are designed to aid easy and thorough mixing. The box comes in four sizes, ranging from 5 cu. ft., 50 lbs., to 27 cu. ft., 210 lbs.

The Petco mortar table is as portable as an ordinary card table. Constructed of 16-gauge steel, it is reinforced with 6 angles and has flanged edges and beveled corners to prevent tearing of clothing and personal injuries. The table is in two parts, non-collapsible, and is constructed to hold 600 lbs. It is supplied in two sizes, one 45 in. square and 30 in. high; the other 30 in. square and 20 in. high.

Efficent Material Handling!

with

SYNTRON

"VIBRATORY"
MATERIAL
HANDLING
EQUIPMENT

A complete line of equipment for handling bulk materials — from fine powders to big chunks — hot or cold — dry or damp — in all kinds of manufacturing processes.

VIBRATORS to eliminate arching and plugging in bins and hoppers, and to keep them open and free-flowing. Small models for little hoppers — large models for big bins and bunkers.

VIBRATORY PACKERS to settle and compact materials in various containers, from phials to barrels.

VIBRATORY FEEDERS with variable control of rate of flow — feeding materials to crushers, grinders, screens, belt conveyors, ball mills, etc. No gears, motors, eccentrics, sprockets, rollers to wear out, moving force is electromagnetic reciprocation. Available in various sizes and trough styles, with capacities from pounds to 500 tons per hour.

DRY FEEDER MACHINES, complete controlled feeding units made up with an electric vibrator on the supply hopper, assuring a free flow of material to the variable control Vibratory Feeder. Controlled feeding of dry chemical reagents in water filtration processes.

WEIGHING FEEDERS maintaining a constant weighed flow of materials in blending and mixing processes.

The power, pulsating vibrations of an electromagnet, operating from 110, 220 or 440 volt A.C. provides the driving force.

You can engineer SYNTRON "Controlled Vibration" in your new plant layout — or ease troublesome spots in your present processes.

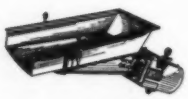
For literature and information, write to —

SYNTRON CO.

385 Lexington Homer City, Pa.

ELECTRIC VIBRATORS

VIBRATING PACKERS



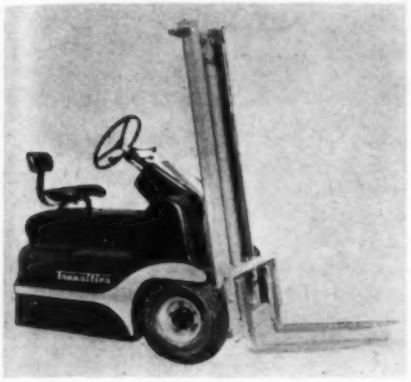
VIBRATORY FEEDERS

DRY FEEDER MACHINES

WEIGH FEEDER MACHINES

● High-Speed Lift Truck

A gasoline-powered fork lift truck of unusual design and simplicity is now being manufactured by Transitier Truck Company, 2477 W. 23rd Street, Portland 10, Ore. Named "Transitier" by its designers, this truck, after being field tested for more than a year, is now in large-scale production. Lift capacities of 1,000 and 2,000 pounds make possible high-



speed loading and unloading of highway transport trucks and railroad cars.

Pneumatic tires allow fast travel on bumpy and uneven road or platform surfaces. Some of the notable features include: all-welded one-piece body frame construction of heavy gauge steel stampings; four-cylinder water-cooled fabricated "Cobra" engine developing 26 hp.; 61-in. turning radius for maneuverability in narrow aisles and congested warehouses; hydraulically operated lift and tilt of load-carrying mast. Operated hydraulically, the Hydroflex clutch can be adjusted or changed in 15 minutes.

● Vertical Compressor

The Grimes Company of Dallas, Tex., has developed a vertical air compressor that is outstanding for the floor space it saves. The space-saving feature has been developed by designing the unit with the tank upright, with the motor and air compressor unit mounted on top.

Three models have been developed—the model 25-V, which as a 20-gal. tank with a 1½-cu. ft.-per-minute air displacement; the model 50-V which has a 30-gal. tank and displaces 2.7 cu. ft. of air per minute; and the model 75-V with a 30-gal. tank that displaces 4.07 cu. ft. of air per minute.

The model 25-V requires floor space only 20 in. in diameter and the other two models require only a 24-in. circular space. All three units are equipped with a single-phase motor that operates on either 110 or 220 volts. The model 25-V has a ¼-hp. motor, the 50-V a ½-hp. motor, and the 75-V a ¾-hp. motor.

These compressors are made from high quality steel with electric welded construction. They have withstood a 400-lb. hydrostatic test and have a 200-lb. working pressure.

Roger Blaney has been appointed sales engineer to cover the Sacramento and San Joaquin Valley for Noble Co., manufacturer of cement and aggregate batching plants, according to H. L. Vines, general sales manager.

Prior to this appointment, Mr. Blaney was night layout foreman in the factory, where he spent 2½ years fabricating and erecting Noble equipment.

truck-man

BUILT TO DO BLOCK JOBS BETTER

ASK ANY OPERATOR

$865

62' Platform

f. o. b. factory

Buy from

TRUCK-MAN'S BLOCK MACHINERY SPECIALISTS

Anchor Concrete Mach. Co. Columbus, Ohio
A. N. Olsan Rock Rapids, Iowa
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Concrete Transport Mixer Co. St. Louis, Mo.
Contractors Mach. & Equip. Co., Hamilton, Ont., Canada
C. H. Jones Equip. Co. Salt Lake City, Utah
C. J. Rahn Co. Newark, N. J.
Wittsmann Machinery Co. Farmingdale, N. J.
Kent Machine Co. Cuyahoga Falls, Ohio
Fleming Mfg. Co. St. Louis, Mo.
F. C. George Machine Co. Orlando, Fla.
Lith-I-Bar Co. Holland, Mich.
Llewellyn Mach. Corp. Miami, Fla.
R. S. Reed Corp. Three Rivers, Mich.
Stearns-Oakes Sales Co. Adrian, Mich.
Slane & Sons Greenfield, Mass.

Yes, for SAFER, FASTER, BETTER handling of concrete blocks—Truck-Man has what block manufacturers demand:

- Ample capacity—many carry over 60 blocks.
- Easy lift and drop, soft start and stop—handles green blocks gently.
- Hydraulic lift and gasoline power—ease and speed handling.
- Cat-like maneuverability possible only with 360° steering.
- Easy on-and-off, simple and safe operation by unskilled drivers.
- Low first cost, low operating cost, low maintenance cost.

Ask the Truck-Man dealer in your territory about performance, service and economy, or write us for catalog.

a product of

truck-man INC.

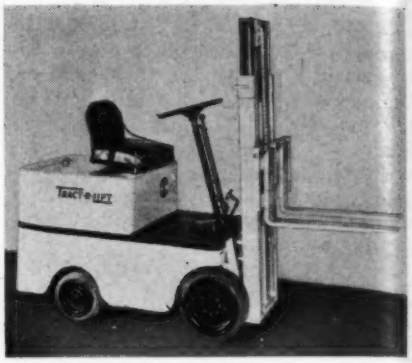
1422 West Ganson, Jackson, Mich.

● 2,000-lb. Fork Truck

A new, compact, gas-powered "Tract-R-Lift" fork-truck with 2,000-lb. capacity at 24 in. from the heel of the fork has been announced as being available for immediate delivery by Tract-R-Lift Corporation, 605 N. Aberdeen Street, Chicago, Ill.

Measuring only 28 in. wide by 61 in. long by 60 in. high and weighing 3,050 lbs., this new Tract-R-Lift has been designed for rapid materials handling through narrow doors and aisles and in cramped quarters. Turning radius inside is 6 in.; outside 67 in. A single hydraulic lift-and-tilt control lever raises or lowers the forks and tilts the load forward or backward in any combination of simultaneous movements desired by operators. Maximum fork height with 5-ft. mast is 84 in.; with 7-ft. mast, 108 in. The mast has a 5-degree tilt forward and a 10-degree tilt backward from vertical. The forks have an automotic stop at maximum lift height, and are adjustable from 9 to 26 in., outside widths.

Speeds up to 10.9 m.p.h. forward and 8.9 m.p.h. in reverse are provided, with low speed gears in both forward and reverse. Power is furnished by a 4-cylinder, water-cooled Waukesha ICK gasoline engine, capable of handling full loads up inclines as steep as 15 degrees. Cool running is assured by a positive circulation water pump and large radiator. Fuel consumption is claimed to be 2 gallons of gasoline for 7 to 8 hours of normal operation.

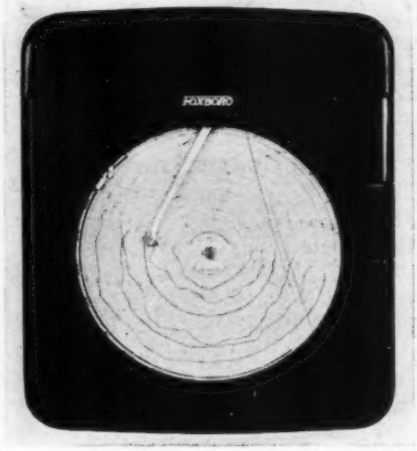


Easy steering is claimed under all operating conditions, regardless of loads or speeds, through the use of a specially-engineered axle and steering gear having sealed needle-and-thrust bearings. Full, double-shoe hydraulic brakes lock automatically when the driver leaves the seat.

The front-wheel-drive unit is mounted integrally with the transmission and engine to provide easy access to all parts and unusual strength to resist damage.

● Multi-Recorder

The "Multi-Record Dynalog" electronic recorder of the Foxboro Company, Foxboro, Mass., was recently exhibited for the first time at the I.S.A. Instrument Show in Philadelphia. It is a high-speed,

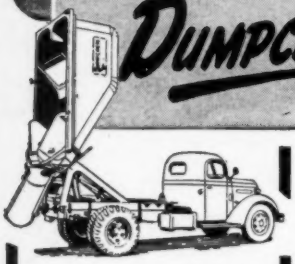


electronic instrument, making from one to six different records on one circular chart. Recordings are registered as dots closely spaced so as to make virtually continuous lines. The recorder has only one measuring system, either resistance bulb or electromotive force type, but a positive-acting switching unit automatically brings the vari-colored pens into recording position at 6-second intervals, in any sequence desired. The sequence and number of points may be changed at will. Color-coding prevents possible mismating of circuits and pens.

An innovation in the design of the recorder is the use of its "Rotacolor" pen wheel holding the six recording pens, which are magnetically selected in turn and held in recording position by a single pen arm. The instrument can be used for measurement of temperature, pressure, liquid level, speed and other process variables.

IN CHICAGO
IT'S DUMPCRETE CONCRETE* AGAIN!

DUMPCRETES HAUL 14 MILES IN CHICAGO TRAFFIC



The Imperial Ready Mix Company's 14 Dumpcretes are busy hauling top-quality air-entrained concrete in and around Chicago.

The above photo shows a Dumpcrete pouring foundation piles at the new A. B. Dick Co. plant after a 14-mile, 50-minute haul.

By controlling the mix at the central plant, every load is uniform. Each has just the right amount of air to maintain top-to-bottom uniformity. No additional air is beaten into this "controlled mix" by the non-agitating Dumpcretes during the haul . . . so the delivered concrete is all according to specification.

The Dumpcretes save money too. They cost less to buy and less to run.

Every concrete man wants to deliver better concrete at lower cost. Write for complete information today.

The Dumpcrete Body

Lightweight, watertight, loads fast, dumps fast or slow, places anywhere, costs less to buy and run. Ideal for hauling aggregate, coal and earth.

• • •

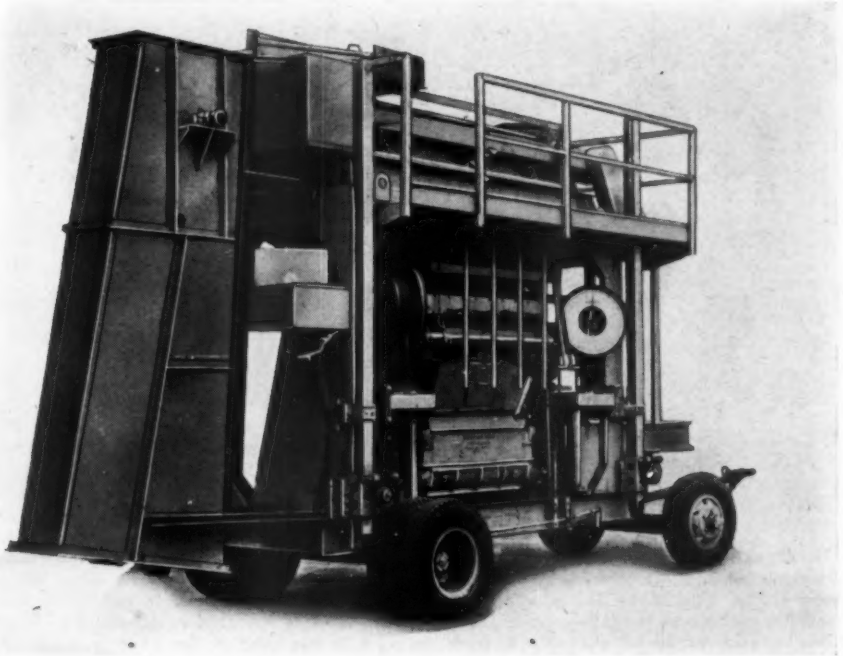
*** Dumpcrete Concrete**

is central-mix air-entrained concrete hauled and placed with the speedy, low-cost Dumpcrete. Provides top-quality, plastic, workable and non-segregating concrete, saving up to $1.00 per yard.

DUMPCRETE DIVISION
MAXON CONSTRUCTION CO., INC.
504 Talbott Bldg., Dayton 2, Ohio

• Portable Asphalt Plant

A portable asphalt paving plant which rolls on its own wheels from job site to job site and has a capacity of 30 to 40 tons per hour of bituminized aggregate is now being manufactured and marketed by Madsen Iron Works, Inc., 5631 Bicket St., Huntington Park, California. Designated as the "1000-lb. Madsen Asphalt Paving Plant," this unit is suited to out-of-the-way road jobs where long hauls are impractical and the size of the job does not warrant permanent installation of a large plant. The plant can be profitably moved for jobs as small as 1500 tons, yet can handle jobs as large as 7000 to 10,000 tons.



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BIG SAVINGS POSSIBLE

Air-Activated

in Handling Bulk Cement

CONVEYOR

Is your cement storage bin 100 feet or more from the siding? Are there any obstructions between storage and siding regardless of distance to make mechanical handling impractical?

Look into the merits of the Robinson Air-Activated Conveyor. With it, you can get shipments in hopper bottom cars; unload each car in two hours or so; and operate season after season without heavy maintenance. Pipes do not clog because the cement does not encrust. There are no continuously moving parts, screw feeds, bearings, etc., that so frequently cause shutdowns and maintenance.

If you wish to save in costs for handling your bulk cement, investigate the Robinson System. Write to us.

ROBINSON Air-Activated CONVEYOR SYSTEMS

Division of MORSE BOULGER DESTRUCTOR CO.

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Represented in England by Blaw-Knox, Ltd., London

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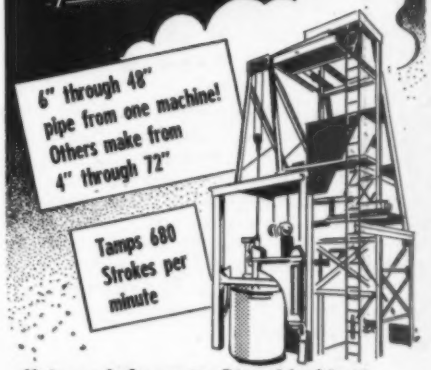
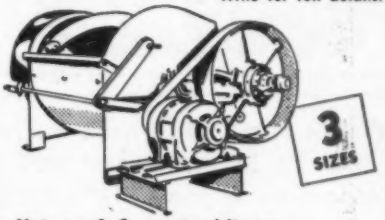
Universal

Pipe-Making Machines are real profit makers because they're built by pipe-makers! ... They produce more pipe in fewer man-hours ... at greater profit!



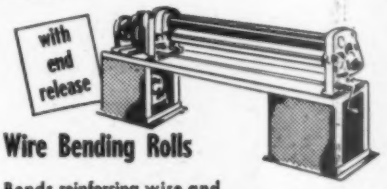
Universal Concrete Pipe Machines

Real money-makers because they make finest ASTM Specification pipe at lowest cost of operation and maintenance. Designed and built by experts with a quarter century pipe making experience. Write for full details.



Universal Concrete Mixers

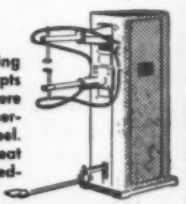
Work horses for manufacturers of concrete products. Simple, dependable over years of continuous operation. Save on first cost and upkeep. Capacities: 28, 42 and 50 cu. ft. Send for information.



Wire Bending Rolls

Bends reinforcing wire and steel plate to any radius, accurately, quickly. Quick, easy removal of completed cages. Extra heavy frame and oversize bearings, with covered gears and overload safety feature.

Wire Mesh Welder



Specially designed for welding reinforcing wire (but adapts for many other uses). Best there is for steady heavy-duty service. Fully enclosed in steel. Water-cooled electrodes. Heat control switch. Swivel foot pedal leaves both hands free.

"It's better to own Universal Equipment... ...than to compete against it!"

Write Today for details, prices

UNIVERSAL CONCRETE MACHINERY CO.

297 South High Street Columbus, Ohio

DRY WALLS

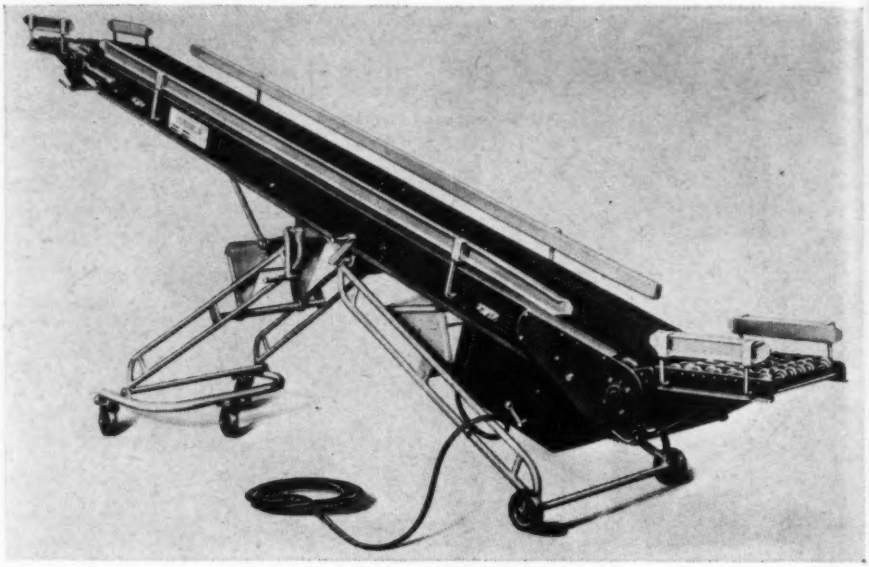
Interior or Exterior
Above or Below Grade

Eliminate costly guess work in solving wet wall problems. Seal and beautify porous walls of concrete block, tile, stucco, etc., with Spray-O-Bond Concrete Sealer. It's easy to apply — almost like brushing on paint. Used successfully by contractors for over 20 years. A post card will bring you the name of your nearest dealer.

SPRAY-O-BOND COMPANY
2225 N. Humboldt
Milwaukee 12, Wis.

spray-O-bond

Easy to erect, this portable plant is equipped with the Madsen-patented jack legs on all four corners, making it possible to erect the plant to its full operating height in 2½ to 3 hours without the assistance of a crane, jim poles or skids. A single source of power, either electric motor or diesel engine, operates all parts of the plant. Only the lower half of the elevator is removed when the unit is prepared for travel. The upper section slides on greased rails. A chain hoist installed on the equipment raises the upper section of the elevator to operating position, and lowers it to transport position. The bucket chain is not removed.



The Rapids-Standard Co., Inc., Rapistan Bldg., Grand Rapids 2, Mich., is the manufacturer of two pieces of equipment for loading concrete products on trucks and semi-trailers. Shown above is the "Stevedore, Jr." power belt conveyor, which takes blocks or silo staves from stockpiles and moves them to a point above the bed level of the carrier, whence the "Rapid Roller" gravity conveyor takes over and carries them to the front of the truck or trailer. All manual handling between loading and unloading the conveyor is eliminated.

Why a man to handle 50 tons of steel pallets daily when a 1/4 H. P. motor will do the same work better?

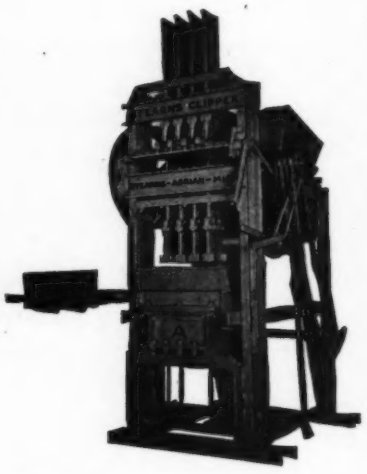
Modernize your present 18" x 26" plain pallet magazine fed block machine. Make it a truly one man operated machine by attaching a

DOMINE AUTOMATIC PALLET FEEDER*

1. You cut your operating labor on each machine by one-half.
2. You cut your lift truck operations by one-half by eliminating the moving of empty racks in plant.
3. You can cube your cured blocks in front of block machine.
4. You double the life of your pallet feeder chain as only a few pallets are carried in magazine.

*Patent Applied For

DOMINE AUTOMATIC MACHINERY CORP.
155 Gould St. Rochester 10, New York



The Clipper Stripper, shown above, available in 5 models, is only one of the popular machines in the ANCHOR Line of Complete Equipment for the Concrete Products Plant. ANCHOR Engineering Service in the design of new plants or revamping older operations is nationally famous. Consult us before you buy equipment or modernize your plant . . . it costs no more.

Stearns Clipper Stripper Machines; Stearns Jolterete Machines; Stearns Mixers; Cast Iron and Press Steel Pallets. Straublox Oscillating Attachments, etc. Repair parts for: Anchor, Stearns, Blystone Mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
G. M. Friel, Manager Columbus, Ohio